

MODEL AIRPLANE NEWS

10th Year of Publication

DECEMBER, 1938

20¢



Amiot 341 Long Range Bomber

(See Page 9)

John K. ...

DON'T BE A SECOND-RATER! Buy 'Burd' and Get the Best!

PROVEN PERFORMANCE PAYS!

the WORLD RECORD HOLDER

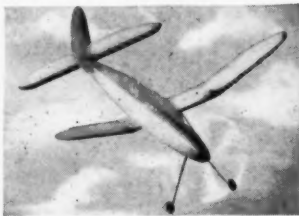
ITS PERFORMANCE SPEAKS FOR ITSELF!

From Alaska to New Zealand, from Oshkosh to New York, Korda's WORLD RECORD HOLDER stands out as the consistent prize-winner. At contests, everywhere, you will find this spectacular flying model a champion. The present holder of the world record by virtue of its fifty-four minute flight. It still is extremely simple for beginners to build. See one at your dealer's.

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(This model performs best on a good grade of fresh rubber. To insure freshness sets are packed without rubber.)

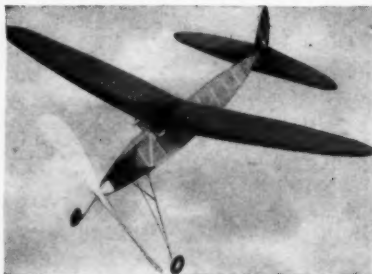
43" WINGSPAN only \$1.00 complete postpaid



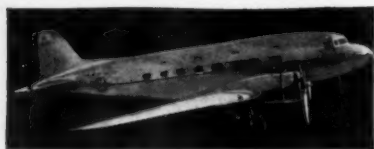
the CONTEST WINNING THERMALIDER

Don't feel down-trodden and disappointed because you can't get the flying you have always read about but never achieved. Do as tens of thousands of others have done who have had the same experience. The Thermalider is the model that introduced real flying everywhere. It is the tops in performance and so easy to build. It is designed along simple lines in Burd's own drafting department, but its modern features make it desirable for experts also. Have you ever envied the other fellow whose models always perform better than yours? Don't hold back any longer. Be a champion yourself. Get your Thermalider Now.

30" WINGSPAN 50¢ P.P.



SUCH FINENESS IN QUALITY and DETAIL IN CONSTRUCTION IS A BUY AT ANY PRICE!



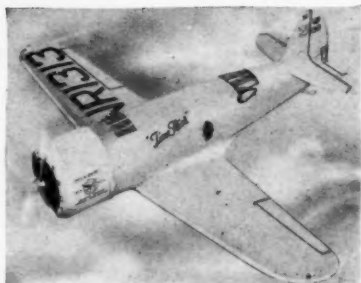
DOUGLAS SLEEPER

In this limited space we could hardly tell you what this terrific kit contains. In short some of the features are: retractable landing gear similar in operation to the real plane, regular turned nose cowls, fronts that make it very easy to have your ship look exactly like the real one, complete colored dopes and many other desirable features. Don't miss this one! Get it now. **only \$2.00 P.P.**

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This was the last creation of one of the great pilots in aviation history. It represented all the skill and knowledge of the world's finest technicians and experts. Great performance was expected of it. However, due to the untimely death of its creator, it is doubtful that this will ever be flown again. This set is the only authentic replica in existence. It is enormously detailed with movable controls, retractable landing gear, retractable hatch cover and numerous other features. The set is exceptionally complete including colored dopes and true insania and markings. Get this rare model Now.

only \$2.00 P.P.



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In ENGLAND: Elite Model Planes, 14 Bury New Rd., Manchester.

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In SOUTH AFRICA: Model Aircraft, Ltd., 23 Dock Rd., Capetown.

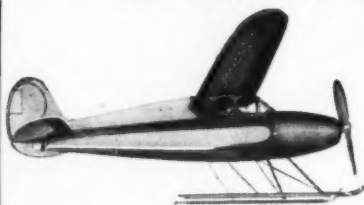
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36" WINGSPAN

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Giant performance and value is in each one of the large cartoons which makes up a 5 ft. flying model. Imagine the size of these enormous flying beauties as they soar away after a beautiful take off. See one at your dealer's.



FAIRCHILD 24

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CURTISS ROBIN

A Hip! Hurrah! for "Doug" Corrihan and another for the ship he flew. Get an exact replica of "Old Faithful." "Burd" has one that's a "hot-ey." Buy it Now and get started on your trans-atlantic hops.



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Only \$1.00 P.P.



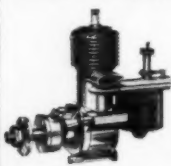
AERONCA MODEL K

These kits represent the biggest dollar's worth you've ever seen. They are complete in every respect and no other parts will be needed to finish them off. They make dandy flyers and almost anybody can build them. Get a look at one of these at your nearest dealer.

CURTISS HAWK PSE
At last you've gotten a model in this Army job that's big enough to work with. It is a dandy looking model when it's finished. Get yours Now.

RYAN ST
Very few low wing are good flying models but here is one that is certainly surprising. See one at your dealer's. At Once.

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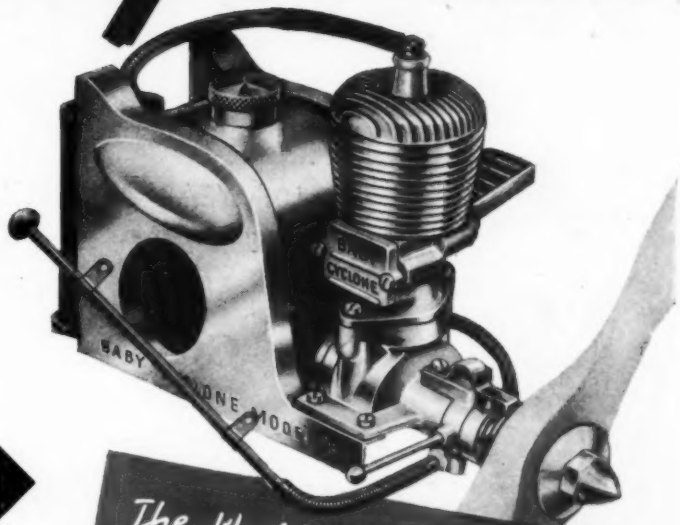
More than 100 hours continuous run with wide open throttle! No other engine has ever equalled Baby Cyclone's supreme performance in this gruelling test of materials, engineering and precision manufacture.

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Model AIRPLANE News

10th YEAR OF PUBLICATION

VOL. XIX

No. 6

Edited by Charles Hampson Grant

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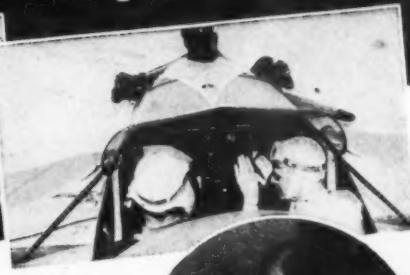
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20 hours
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flight
training

1123 hours—aviation mechanics



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520 hours—executive subjects

FOR YOU who want a career in the operating and business fields of air transport, the Aviation Operations and Executive Course is recommended.

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- 520 hours in executive subjects
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All of your training is of college and professional school rank. You are acquainted with fundamental principles; also their application in the solution of specific problems. Your hours of training exceed the

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Section MA-12

WINNER

of the three most important contests in the world



The wing span is just 1/2 inch less than four feet. It is perfectly streamlined, and uses the new one bladed, feathered propellor.

THE WORLD'S FINEST CHRISTMAS PRESENT FOR ANY BOY. 47 1/2 INCHES WING SPREAD—same size as the championship model designed by JIM CAHILL, Captain of America's 1938 Lord Wakefield Team. THIS MODEL WON—

MOFFETT TROPHY

America's leading yearly model competition. Jim Cahill won this event with the model pictured above. And you should win many contests by making this model from the kit we offer you free.

AMERICAN ELIMINATIONS

Against all the best models produced in America this year Jim Cahill won this event with this model. He was appointed Captain of the American Team and sent to Paris to compete for the Lord Wakefield Trophy.

LORD WAKEFIELD TROPHY

This is the world's most important model contest. Leading model builders everywhere enter their ships. Jim Cahill's model which is offered for a year's subscription to AIR TRAILS won the event!

Three Championships make it the WORLD'S CHAMPION MODEL. This model has been made up in Kit Form under the supervision of Jim Cahill and is offered you for a limited time only absolutely **FREE** with a year's subscription to AIR TRAILS.

Enclosed is \$1.50. Kindly send me AIR TRAILS magazine for one year and the JIM CAHILL, CLODHOPPER II WORLD CHAMPION MODEL absolutely FREE.

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MODEL KIT
AIR TRAILS FOR
ONE YEAR**

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and you get all this
for only
\$1.50



The great Douglas DC-4 (weight 65,000 lbs.) leaving the ground for the first time, as seen by the entire Curtiss-Wright Tech student body. Note tricycle landing gear.

MORE CURTISS-WRIGHT TECH GRADUATES WORKED ON THE DC-4
than those of any other school. Curtiss-Wright Tech does not guarantee positions for its graduates—no reputable school would—BUT



Mr. Donald Douglas
PRESIDENT OF THE DOUGLAS AIRCRAFT CO., SANTA MONICA, CALIFORNIA
Says IN A LETTER TO MAJOR C C MOSELEY

..... During the past several years, we have employed a large number of your graduates and have found them to be eminently satisfactory. Efficient workmen capable of working with the care and precision demanded by the Douglas Aircraft Company are the product of thorough training and are difficult to find. You are to be congratulated on the fine job your Institute is doing in turning out such men.

*No higher compliment can be paid Curtiss-Wright Tech and its graduates
—nor is there any higher authority than Mr. Douglas.*

Curtiss-Wright Tech is APPROVED by the U. S. Government, ACCREDITED by the State Board of Education, ENDORSED by the Aircraft Industry and offers specialized training only in

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UNDER PERSONAL SUPERVISION OF MAJOR C. C. MOSELEY, PRESIDENT

Aviation's Dare-Devil Scientists



Roscoe Turner's Laird Special with a Wasp 1050 hp. engine in which he won the Thompson Trophy. (Morrison)

YESTERDAY'S aviation scientists were bearded old men thrusting lean noses into musty note-books, gazing through watery

eyes at vibrating wind-tunnel models, and scribbling figures with gnarled, veined fingers. But to-day's progeny are lean-muscled, tensed jawed youths who hold tryst once each year in Cleveland and who call their convention the National Air Races.

A score of years ago, "Aerodynamicist" was a title few persons could pronounce and far fewer still claim. But science moves in a strange way to get what it wants.

To be sure, great discoveries have been made in costly, almost fanatically equipped laboratories. Men of awesome scholarly reputations have solved important problems which retarded scientific progress. But how many of the truly immortal discoveries have been made by obscure dreamers working poverty-stricken with woefully inadequate equipment? How many of the names in Science's Hall of Fame were once only despondent tenants owing half a year's back rent; whose bellies cried for the food the money that had gone into laboratory equipment could have bought them? Madame Curie, Gutenberg, Crookes, Welsbach, Fin-

grown into startling strength and power. Production lines, contracts in units of a thousand or more, fabulous financing and incredible advancement marks her career today. And yet without exception the recognized leaders in today's aviation industry have a memory of ridicule, empty purses, nights of work without sleep and actual hunger.

One Pacific Coast company now has a back-log of one hundred million dollars in contracts; more than the value of the entire world's aviation industry a quarter of a century ago.

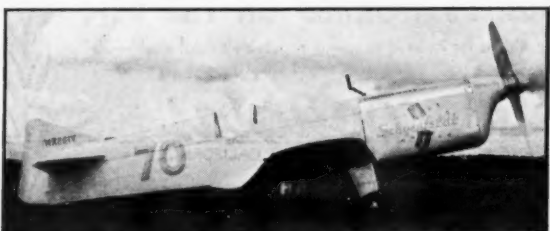
The United States has an aerodynamics laboratory with equipment unapproached by that of any other nation. Yearly this group of scientists force aviation ahead with a thorough firmness. Langley's ponderous wind tunnels, delicate measuring instruments and limitless resources make aeronautical progress a matter of simple units.

But aviation's penniless practical dreamers refuse to be denied. Their knowledge is a recollection of screaming slip streams, coughing motors and things going wrong at three hundred miles per hour. Every mistake screams in their ears: "Why? Why? Why?" A paper-thin wing vibrates itself into tattered bits of fabric and wood; why? A highly supercharged engine explodes in their faces; why? A rudder wags like a tackling mainsail and is suddenly useless as they coast into a one hundred-mile per hour landing; why?

And something within them cries out for an answer. Give up? Never! There was a reason for that spin which placed one of their number in a cast. And he was seeking that reason before the plaster had dried on his shattered body. Thought. Experiments. Tests. Then the answer and another of aviation's problems solved. In a multi-million dollar laboratory? Not on your life! In a battered old shed illuminated by iridescent globes.

Throughout Uncle Sam's three million square miles these youthful dreamers are working. For to-day's aviation scientists ARE youths; lean, bronzed, hard muscled, keen eyed youths whose one driving force is aviation advancement. One of their number finds remarkable success with a new type airfoil. Another designs an amazingly simple yet efficient retractable landing gear. Still a third finds a high-lift chamber which drags additional horsepower out of a protesting engine. And once a year they convene, each harboring with bursting pride a new aviation development, each anxious to see what his fellow dreamer has accomplished since last they met. Thus the 1938 National Air Races.

This convention of racing pilots the nation over in NOT a circus. It is NOT a gory spectacle of human greed for thrills. Men don't like to die. Men get no thrill out



The Schoenfeldt Firecracker of Keith Rider design won the Greve Trophy with Tony LeVier at the controls. (Yeager)



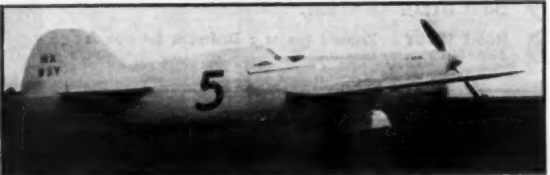
The Chambers R-1 Special with a Menasco B4 of 95 hp. in which Russel Chambers crashed. He died later. (Yeager)



The sleek Crosby CR-4, 300 hp. Menasco C6S4S powered Racer; flown by Harry Crosby. (Yeager)



The Funk Model B Sportplane powered with a Funk DNY-4, 60 hp. inline engine. (Kauer)



Art Chester's "Goon" which he piloted to 2nd place in the Greve Trophy Race. (Tracy from Yeager)

Behind-the-Scene Glimpses of America's Foremost Racing Pilots and Their Fiery Steeds Who Through Their Dynamic Spirit Are Driving America to the Front Rank in Aviation

By ROBERT McLARREN

of hurtling through the air at 440 feet every second ready to scream from released horrid tension should the sound of ripping, tearing wings blast into their tightly-strapped ears. There's no joy in praying fervently that the next moment, the next instant will not be your last.

But there is a thrill in knowing that that new skin-radiator is functioning perfectly; that that new aileron control you've spent months perfecting is controlling your roaring plane easily, efficiently. There is a thrill when you hear a monstrous transport thunder through the night above you: under perfect control with your new aileron design a few months later. You've licked a problem. You've given aviation, the science you love, something worthwhile.

And there's another emotion, a heterogeneous one, when you lance across the finish line going away from the pack and see a handful of the others, forced out of the race, craning their necks up at you. You've a lump in your throat because their new designs didn't function perfectly. But you've a real thrill, for yours did!

Personal animosity, grudge battles, hatred? Don't be foolish! America's racing pilots are the most tightly-knit organization in the world. When you've seen them together having a good meal a few hours before a race; laughing, joking, bantering; then you'll know friendly rivalry is all that is carried in their hearts.

But is dare-devil science strictly a man's game? Not on your life! Jacqueline Cochran, who is entirely feminine, an owner of a chain of beauty shops, came out on top of the heap in the 1938 Bendix Trophy Dash, a 2200-mile event from Los Angeles (Burbank), California, to Cleveland, Ohio, with additional prize money for a continued flight to Bendix, New Jersey. "She's just a girl with lots of flying time," some have said. But did you know she actually designed a new-type drift indicator which she used for the first time in her Northrop "Gamma" monoplane in the 1935 Bendix? She's made her scientific contribution along with the rest. And she's proud of it.

In the high cockpit of the sleek Seversky Executive military racer, which had set a new East-West Transcontinental record of 10 hours, 3 minutes, 7 seconds, just two days previous with Major Alexander P. de Seversky at the controls, she raced down the darkened runway at Burbank at 3 a.m. in the morning, dangerously heavily-loaded with a ton and a half of gasoline, a few seconds before Starter Larry Therkelson had poised a tiny flash above his head. The runway was in total darkness due to the danger of windshield reflections. The slim, heavily helmeted head of Miss Cochran eyed him narrowly. Then the hobbling flash arched down and the giant P & W Twin Wasp Senior engine barked

power, twelve hundred horsepower of it, and the ship moved forward.

Painfully slow at first. Flames vomited from twin exhaust stacks and the sleek racer careened down the runway. And a crowd of fifty thousand persons, almost an air meet in itself, caught its breath as the orange-violet exhaust glow hugged the ground far away in the night. Still on the ground and fifty-foot high tension wires to be cleared! But as though she had deliberately flaunted the crowd's tenseness, she eased the stick back hurriedly and the twin blobs of cherry-red flame vaulted lightly into the sky.

A mile high in the night she donned a strange rubber nose and mouthpiece, a Mayo Oxygen Mask, the latest scientific development for sub-stratosphere flying. A girl test pilot heading for dangerously high altitudes with only a thin yellow sheet of rubber between her and unconsciousness. Flying a badly overloaded ship five miles in the air with a radical new type oxygen mask for thrills? Ask Jackie and she'll tell you: "I want to do something for aviation. Prove new things. Help advance a new science. It's in my blood and I want someday to point out a new gadget and say: 'I helped perfect that!'"

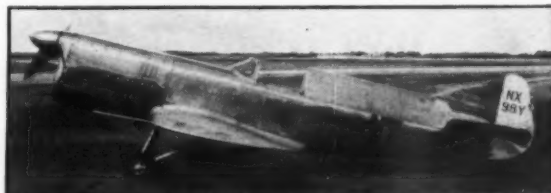
Frank Fuller, Jr., scion of a San Francisco paint fortune and veteran speed pilot, flew his identical Seversky model into Cleveland half an hour behind the plucky girl. Paul Mantz, movie stunt man, in a Lockheed "Orion" monoplane; Max Constant, flying Miss Cochran's Beechcraft D-17S; and Ross Hadley, Hollywood explorer in a similar ship, placed in that order.



The Marcoux Bromberg Racer with a 700 hp. Wasp Jr. which placed 2nd in the Thompson Trophy Race. (Winkler)



Jacqueline Cochran's Seversky Racer AP-7 powered with a 1025 hp. engine that won the Bendix Trophy Race. (Kauer)



George Dory was severely injured in this Bushey B7M-1 Menasco-powered Special of 160 hp. (Yeager)



The Curtiss Conqueror powered 825 hp. Pearson-Williams Racer with fixed landing gear piloted by Lee Williams.



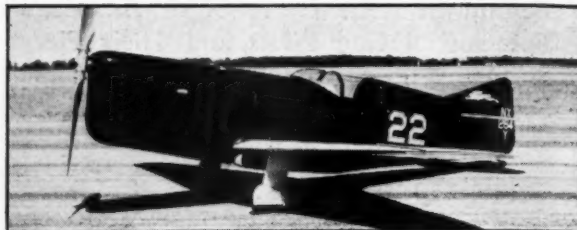
Steve Wittman's famous Flying Box-Car in which he placed 3rd in the Thompson Trophy Race. (Yeager)



Art Chester's "Goon" with cowlings removed showing the inside "works": Menasco C6S-4, 290 hp. (Yeager)



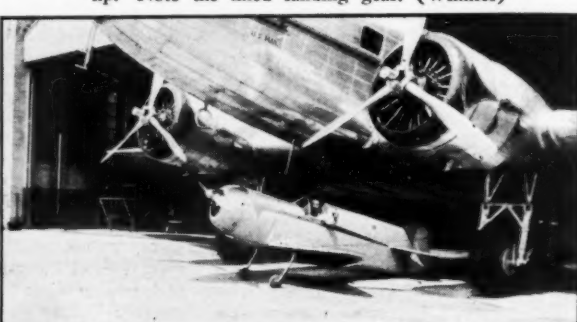
The Delgado Flash with new pants and cowling, built by members of the Delgado Trade School. (Tracy from Yeager)



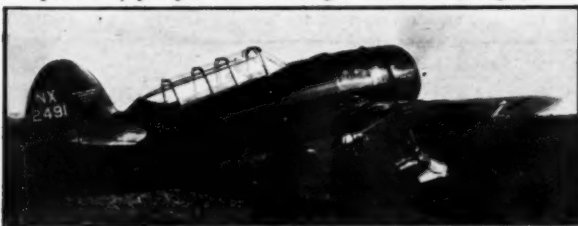
The Marcoux Jackrabbit powered with a Menasco C6S-4 of 280 hp. Note the fixed landing gear. (Winkler)



The races would not be complete without a Keith Rider entry. The Keith Rider Eight Ball with a 290 hp. Menasco C6S-4, piloted by Joe Jacobson and Roger Don Rae. (Yeager)



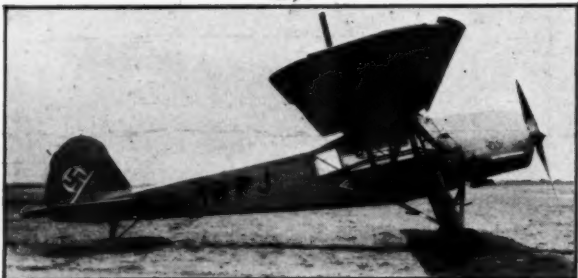
The largest and smallest planes at the races get acquainted. The Douglas overshadows the midget Popjoy Special which later cracked up on the take off. (Tracy)



The Military Aircraft Corp H. M. 1 pursuit ship. It is Hawks' rebuilt "Time Flies" with a twin Wasp 1000 hp. engine. (Winkler)



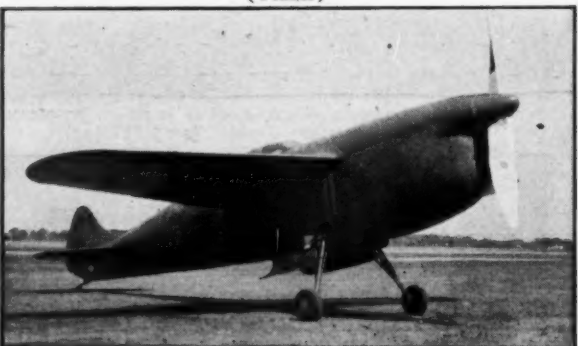
The Wedell Williams "92," revamped for the races, powered with a P & W 550 hp. Fixed landing gears are returning it seems. (Winkler)



The slowest plane at the races; Emil Kropf's Fiesler FI-156 "Storch," powered with an Argus AS-10C, 240 hp. motor. It practically can stand still in the air. Its high speed: 120 m.p.h. (Yeager)



Harold Johnson's clipped-wing stunt plane which provided many thrills. It has a wing span of only 20 ft. (Tracy)



Folkerts Super-Special; a typical example of a super-streamline racer with retractable landing gear. (Kauer)



What was left of Chambers' plane after the crash. His mechanic, Ernie Smith, stands beside the wing. (Tracy)



The Meyers OT-W metal biplane powered with a Warner 125 hp. engine. It did some fine flying. (Kauer)

and nosed into the sub-stratosphere to take advantage of the upper-air winds. But motor trouble brought him down at Woodriver, Illinois, his dream smashed a second time. A year ago his heavily loaded ship was sprinting down the Burbank runway when it began to sway sickeningly. The panted landing gear gave way and the ship skidded along on its belly with five hundred gallons of volatile gasoline sloshing menacingly behind the pilot's head. This year a strengthened landing gear got him into the air safely but motor trouble let him down. One problem solved; another to be answered!

Frank Cordova tried this year to prove the adaptability of trimotor construction to racing plane design with his Bellanca 28-92 Racer. And for six hundred miles he averaged almost 350 miles per hour! But his nose engine coughed to a resigning halt and he continued another thousand miles on two motors. Safety and reliability with speed are his contributions to aviation. And he'll be back next year with the answer to that balky center motor.

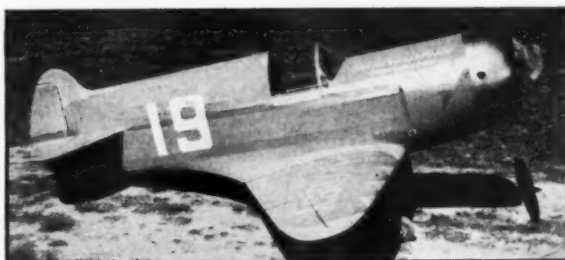
Long-range flying still has its problems but America's dare-devil scientists are solving some of them every year.

Tony LeVier, bespeckled Angeleno, emerged as King of the Closed Course Racers this year with a startling 250.886 miles per hour average over the two hundred mile grind of the Greve Trophy Race. Why did he win? What scientific problems did he solve that baffled the other five planes in the race? His ship, the Schoenfeldt-Rider "Firecracker" is a fairly conventional low-wing monoplane of steel-tubing construction, fabric covered with a tiny retractable landing gear. But Tony LeVier spent months of constant mathematical research on his ship. He designed and tested five propellers before he found the most efficient model.



The new Aeronca K. L. powered with a new Lycoming 50 hp. engine. (Kauer)

He has designed TWO oil coolers, one of the skin-friction type, the other a conventional cartridge cylinder. But that was not enough! He set to work on the Menasco C6S4 supercharged engine and wrought several radical changes on the stock model. What he did no one but himself and a



The Light Airplane Developers F-15. The smallest plane at the races, flown by Walter McClain. (Popjoy 90 hp.) (Yeager)



The Beechcraft D-17S with a Wasp Jr. SB of 400 hp. (Kauer)

handful of trusted workmen know. But perhaps those changes will become apparent sometime this year in Menasco's future models, or even in the designs of other manufacturers. He's done something for aviation and he proved it would work when he won the battle for the coveted trophy.

A nose behind him was Art Chester, no stranger to any follower of air racing and a real dare-devil scientist. The things he's done in airplane and motor design are now accepted practice and this year he was back with even more startling innovations;



Pat Sweeney, Dick Granere's mechanic, starting one of four Foster motors mounted on Granere's plane, to help'er along. (Tracy)

the results of another year's aeronautical progress for him. This time he brought a completely new ship, "The Goon," to Cleveland. Art watched, with a sinking heart, as Captain Michael Detroyat roared by him in the 1936 Air Races in Los Angeles. And he watched especially the performance of the new Ratier two-pitch propeller, a design in which the pitch changes from low into high automatically at a speed of one hundred miles per hour. He resolved to have one and it has taken him nearly a year to cut all the red tape spun out by the French Government to obtain it. It arrived, but more complications had to be ironed out; more problems to be solved! The propeller rotated clockwise instead of counter-clockwise as ALL American motors do. Disheartened? No sir! Art set to work on his big Menasco C6S4 and changed the direction of rotation! That, fellows, is real aviation achievement. Further new ideas was the use of a symmetrical airfoil and changes in incidence at two points: 20 inches out from the fuselage and at the wing-tips.

All of which might have won for him had he not cut a pylon when vaporizing oil exhaust opaqued his windshield. With set jaw he hauled around in a sharp vertical, rounded that pylon, and fought back into the lead! But at the three-quarter mark his ship belched more oil and his vision ahead was neatly blanketed. Under such a handicap he dared not close in on the pylons and he swung wide around the last one. Tony LeVier, coming like a beserk meteor, alert for every opportunity, made his bid. Like a yellow streak he lanced in through the hole and sped home the winner.

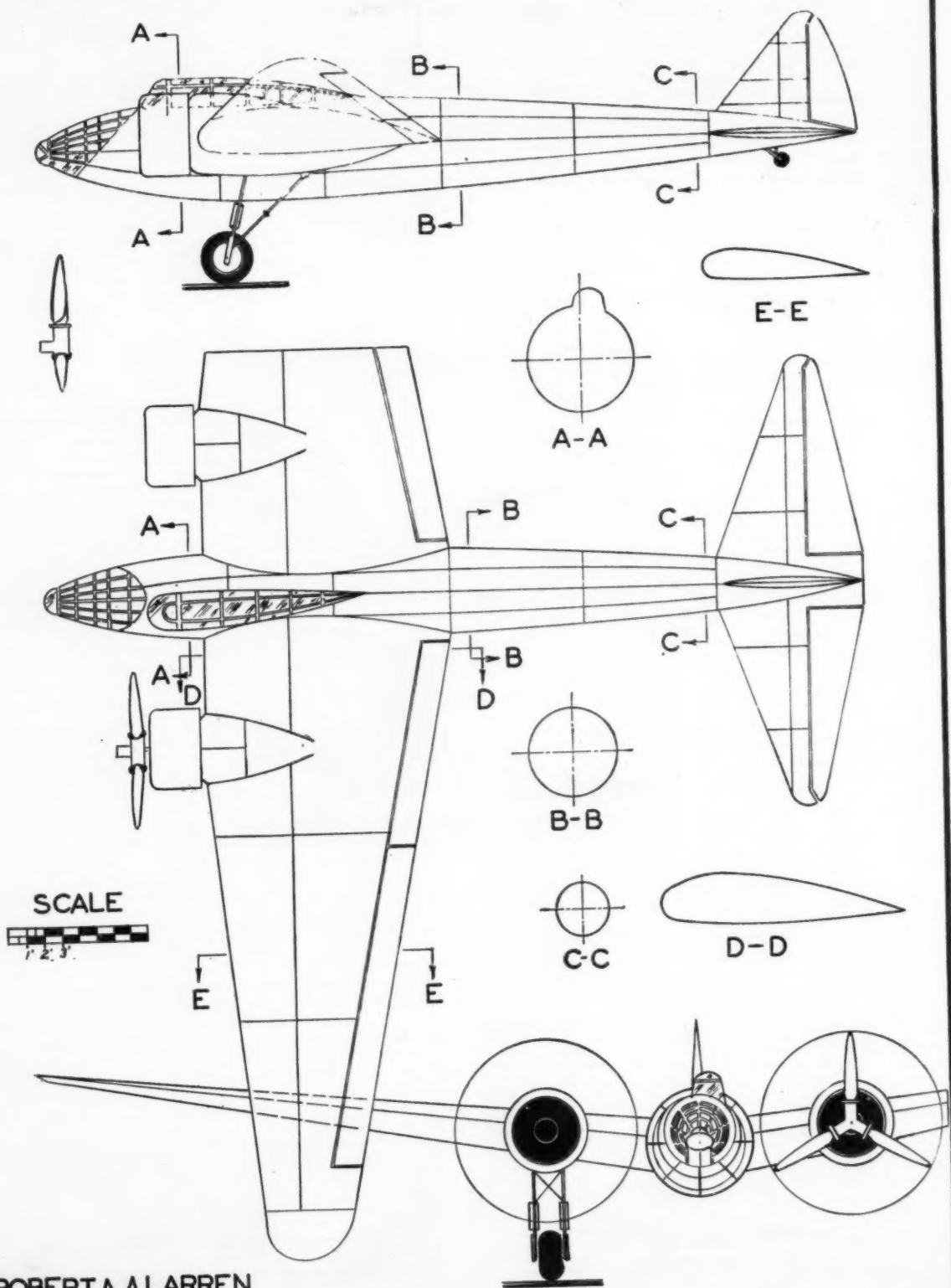
Joe Jacobson of Kansas City flew one of the most beautifully designed ships at the Races, the Keith Rider "Eight Ball," into third place. This ship, tested by Roger

(Continued on page 48)



Earl Ortman and Dave Elmendorf beside the Marcoux Bromberg Jackrabbit and the Twin Row Special (Yeager)

AMTOL LONG-RANGE BOMBER



ROBERT M. LARREN



Mr. Leo Rutledge, I.G.M.A.A. Director of Kansas, explains the design and construction details of the 8 ft. KG which he built, to his class in model building

The Flying Box Car Goes Around The World

Story of a Great Ship

By ROBERT FILE

"FLYING BOX CARS" are what they call them; those big slow flying Gas Jobs commonly known as the KG—the "Granddad" of present day gas models. Since the advent of the smaller type, highly streamlined jobs the KG's have been nicknamed the "Flying Box Cars" due to their large size and enormous wing area. The name KG stands for the designer and builder of the original model. The model was designed in detail by Charles H. Grant and the original ship was built by Joseph Kovel. This was back in 1933 when gas model interest was just beginning to show itself.

After two years of experimenting on the design the complete plans were published in *MODEL AIRPLANE NEWS* in April and May, 1935. The model was designed and stressed for engines of 1/3 to 1/2 horsepower, which explains its large size and sturdy construction. Back in those days the small, efficient, present-day engines were mostly in the experimental stages. The model was designed primarily for aerodynamic stability to prevent crashes and streamlining was

only a minor matter. In spite of its large size it has shown remarkable stability under all flight conditions and it is probably one of the most inherently stable ships ever built.

The KG-2 although having a wing span of ten feet, actually has a wing loading just as light as the average ship of six to seven foot span; due to its enormous wing area. The KG-2 has a wing area of approximately thirteen square feet which is just about half the wing area of the world's smallest man-carrying airplane.

The KG was the first to bring out the

removable motor mount, which was a big step forward in model plane design since it allows a close examination of the entire engine and electrical system without tearing out the nose of the ship to look for engine trouble or to test or renew batteries. The motor mount is of very simple construction and will repay the builder in many ways to have access to the entire engine unit. This also allows the removal of the engine unit to a vise where trouble due to vibration in the ship can be more easily traced. Also, the removable mount is invaluable for saving time at contests—where the engine always act up.

Another very important point in favor of the removable motor mount is in the case of the builder having several ships and only one engine; regardless of the type of ship the mount can be made to slip in any of them. An engine mounted securely in one model practically eliminates its use in other ships without several hours of work "in changing over"; while the removable mount can be used in any

(Continued on page 44)



The ten foot wing span KG, former holder of the world's record for duration. Time: 64 minutes, 40 seconds (with 1/8 oz. of fuel per pound)

The Amiot 341 Long Range Bomber

The Plane on the Cover

By ROBERT McLARREN

THE world is looking on aghast as Hitler threatens the dismemberment of Czechoslovakia, Europe's youngest nation peopled by Europe's oldest race: the Slovaks. Nations are watching with a nervous tenseness unequalled since the holocaustic days of 1914. And La Belle France, land of charm, smiles and beauty, is keying her armaments to the highest note since the Armistice.

And it is strange that the Frenchman's appreciation of beauty should play a part in this rearmament program. But the part it plays is a major one and here's why.

France's aeronautical engineers are characterized by two outstanding traits: an intense interest in aerodynamic research, and an appreciation of beauty. And these two characteristics have combined in maximum quantities which has resulted in her latest and most potent fighting craft: the Amiot 341 Long Range Bomber, shown on our

cover this month.

A twin-engined, long-range, high-performance monoplane of startling performance and symmetry of outline, this aerial dragon is playing a major part in France's aerial armament rejuvenation and on her shark-like wings rests the brunt of France's defense.

Construction is of radically new methods but of proven adequacy. Each wing section is built up in three longitudinal sections; a leading edge, a main spar section and a trailing edge portion. The high-strength steel spar has duralumin sections of progressive thickness and a sheet web reinforced with vertical stiffeners. The leading and trailing edges are built up of open-section profiles. This powerful structure is covered with a stressed skin of sheet aluminum reinforced with longitudinal stringers. This skin is flush jointed and flush riveted.

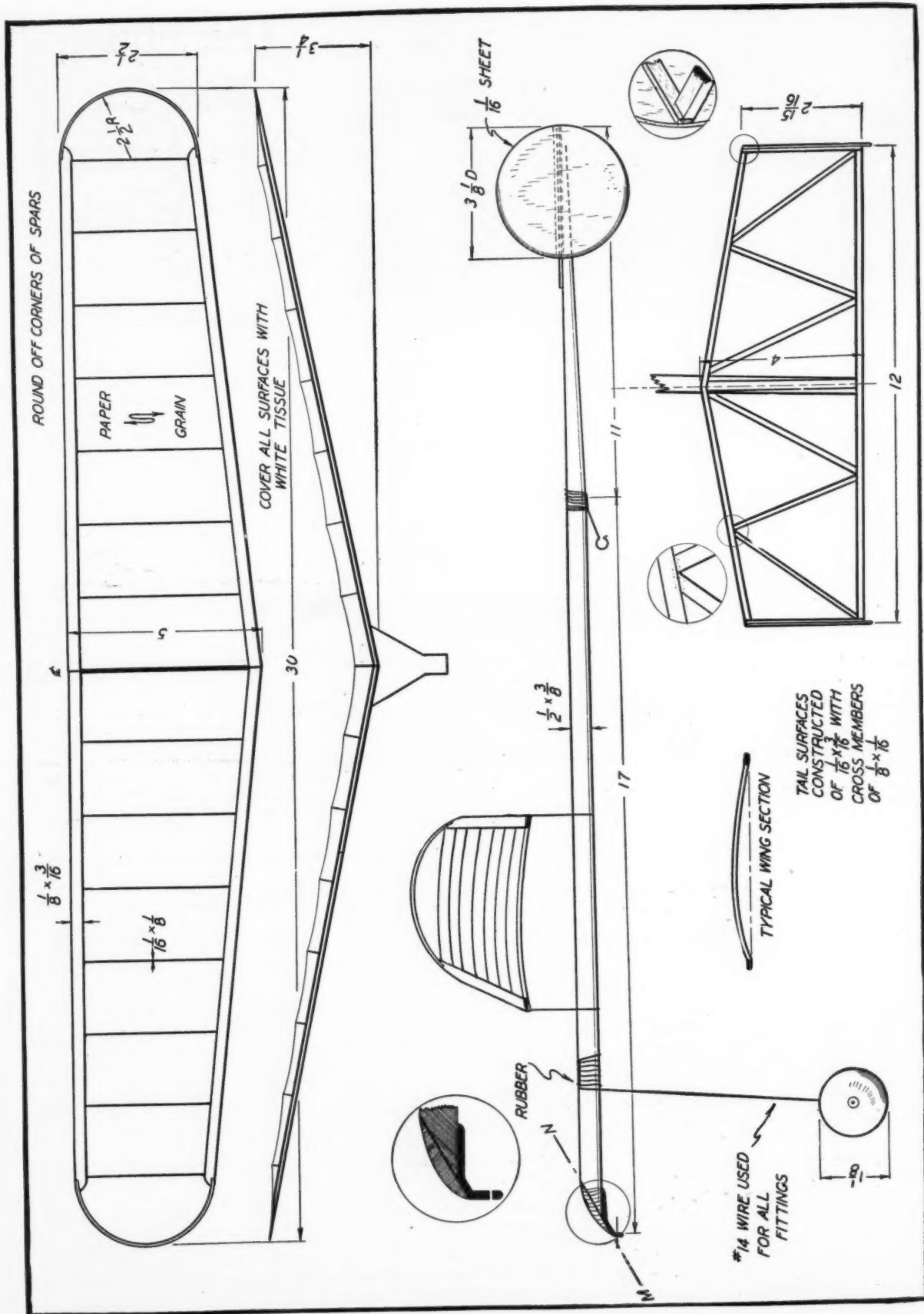
The ailerons and flaps are hinged to an auxiliary spar near the trailing edge. The latter are of the split trailing edge variety of all-metal construction.

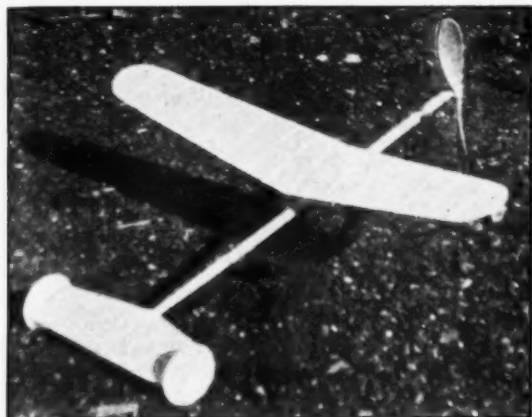
The fuselage is of uniform circular cross-section of monocoque all-metal construction. The structure is built up of a number of primary and secondary frames of open-section steel, longitudinal stringers, and a stressed skin covering. The majority of the load is carried on four main longerons on the central portion of the structure.

The tail units are of complete cantilever construction and of all-metal components. The control surfaces are fabric covered.

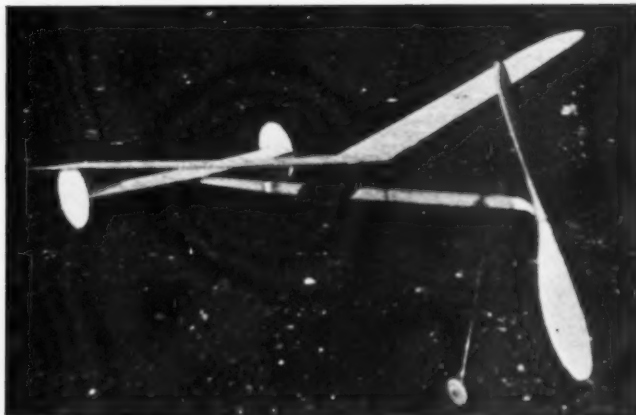
Ingenious design features the construction of the retractable landing gear; a patented design known as the "Electric Knee." This novel gear was designed by the Societe de Air-Equipement (Etablissements Viet).

(Continued on page 46)





Twin fins and large stabilizer gives stability



Note its simple but high performance lines

Build and Fly This Cloud Chaser

GOOD NEWS FOR GROUP LEADERS: Here is a rubber-powered high performance model that can be built by your novice club members. Start the younger enthusiast off right—recommend this model and this MODEL AIRPLANE NEWS series to the less experienced flyers. A little encouragement and aid will go a long ways towards producing a 1940 national record holder in your group.

QUIET now! Tiptoe in and we'll show you the newest cloud chaser at rest. There you are—isn't it a beauty?

With a faster climb than a rising stock market and a sweeter glide than a sea gull, this stick model, especially designed for novice builders, is certain to find favor with junior aeronauts everywhere.

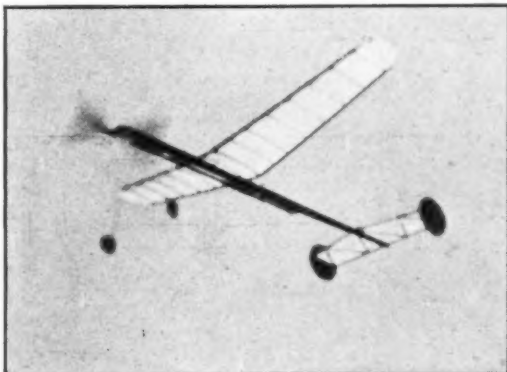
Did you build that beginner's outdoor hand-launched glider MODEL AIRPLANE NEWS presented in its June issue? Then you're all set to continue with this cloud chasing craft which carries on where the glider left off and introduces a host of new building kinks.

Interesting features of this stick ship are its easy-to-make twin rudders and choice of rise-off-ground or hand-launched flights. No "parlor gnat" is this . . . no, sir; it's a big, sturdy flyer thirty inches in wing span. Even if you've never tackled a plane of such proportions, don't hesitate a moment—for besides being a sweet soarer, this stick flyer is simple to build and provides splendid training for the heavier contest entries you'll be building soon.

Before starting construction, let's have a brief sermon on building models, especially outdoor craft:

With proper design, proper construction and proper adjustment, even the most inexpensive model will turn in good flights consistently. But a builder must utilize all three points in his work; so let's resolve to always choose a design with plenty of "flyability," build according to specifications and make all the proper adjustments before ever fully

By BRUNO P. MARCHI



The little ship in full flight: Going up!

winding a model.

You built the beginner's outdoor glider? Fine, then you're off to a good start. Here's lesson No. 2, but it's not a tough assignment—plenty of fun ahead for

those who . . .

Select a medium-hard piece of $3/8 \times 1/2 \times 28$ -inch balsa for the motor stick. Measure in eleven inches from an end on one of the $1/2$ -inch sides and from that point taper the stick to $1/4$ -inch at the rear so tail end of stick measures $3/8 \times 1/4$ inches. With thinned glue, precoat front of stick where large thrust bearing will be glued on. Repeat procedure allowing cement to dry well between coats, filling the pores of the wood to provide a firm gluing base. Then using thicker glue, cement thrust bearing to stick.

While bearing cement is drying, bend the rear hook and propeller shaft from No. 14 wire. For this work a good pair of pliers are most necessary. The few extra pennies invested in pliers of good quality will repay with longer and less troubled service. Contest losses and crumpled fuselages caused by misshapen fittings frequently can be traced to poorly-bent fittings made with inferior pliers.

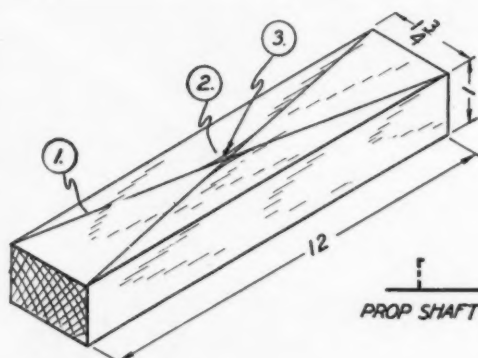
With fittings made, glue rear hook to motor stick, first pre-coating as with the thrust bearing. Then apply another coating of cement, bind with thread and—you've guessed it!—apply a final coating of cement.

After bearing is dry, bevel nose of motor stick as indicated by line M-N on plans. Precoat, then add extra nose piece shown, shaping with sandpaper and cementing liberally. Bind entire nose portion with thread and add several coatings of glue.

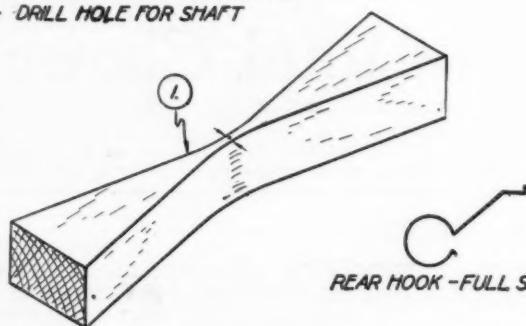
Make full-size drawings of
(Continued on page 54)



Off she jumps: Launched by the author

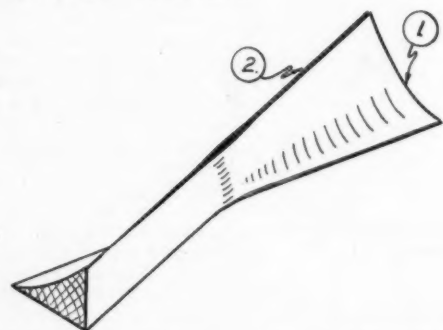


- 1- DRAW DIAGONALS
- 2- LEAVE EXTRA AREA FOR HUB
- 3- DRILL HOLE FOR SHAFT



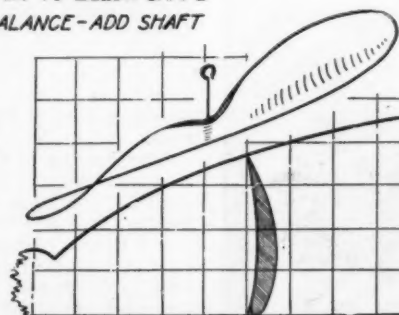
REAR HOOK - FULL SIZE

- 1- CUT BLOCK TO ABOVE SHAPE
- SANDPAPER TO OUTLINE

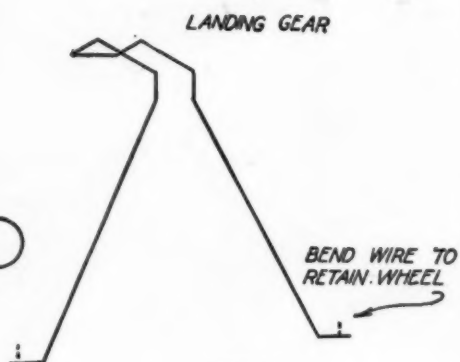


- 1- SAND IN CONCAVE AFTER CARVING TO SIZE
- 2- LEAVE SURPLUS

CARVE CONVEX SIDE TO GOOD AIRFOIL
TRIM TO BELOW SHAPE
BALANCE - ADD SHAFT



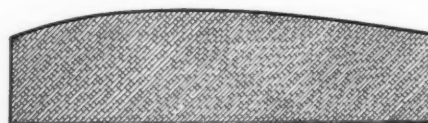
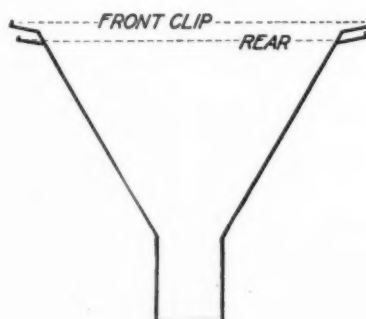
FULL SIZE PROP TEMPLATE



LANDING GEAR

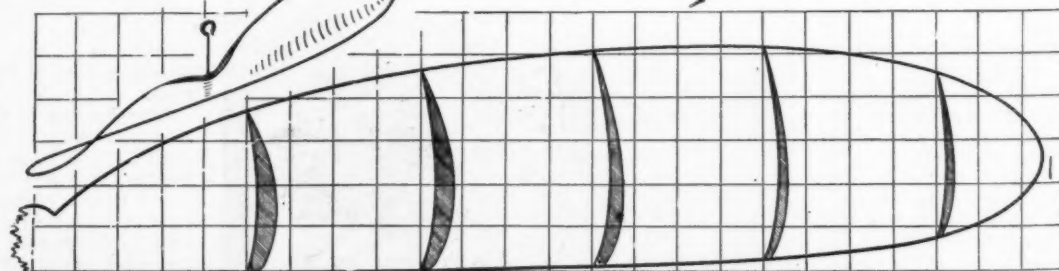
MAKE WHEELS OF
SHEET BALSA
GLUE WITH GRAIN OF
WOOD OPPOSITE

WASHER



TEMPLATE FOR MAKING RIBS
CUT FROM THIN ALUMINUM SHEET

$\frac{1}{4}$ SQUARES

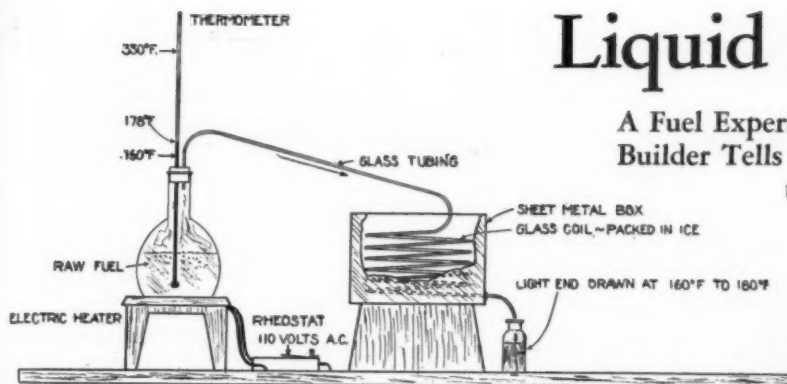


W.F. TYLER

Liquid Lightning

A Fuel Expert Who Is an Experienced Model Builder Tells You How to Produce Or Select the Most Efficient Fuel for Your Gas Motor

By RICHARD RIOUX



ADVANCE TEMPERATURE IN 5°F STAGES EVERY 3 MINUTES THROUGH THE RANGE FROM 160°F. TO 360°F. CHANGE SAMPLE BOTTLES EVERY 20° SEAL AND LABEL IMMEDIATELY.

PROBABLY every model aircraft engine has some time in its life been seeped in an obnoxious concoction, created by a zealous owner with the general hope of developing a new type of fuel, performance or both. Personally, having seen everything from "mountain dew" to embalming fluid dripping from the exhaust ports of countless engines, I feel that this discussion should be limited to the most common and yet the most powerful fuel: gasoline and its various blends.

Various grades of gasoline are produced by several methods of fractional distillation of petroleum. Straight run gasoline has a higher B.T.U. content than cracked fuel and should be used as a base if available. Casing head gasoline is produced by compressing natural gas in the presence of heavy oil, then cooling and distilling. This yields a very good component for blended fuels for controlling the vaporization range. The diagram shows a simple still with which you may draw off various ends at different temperatures. Place them in bottles, then try each one and blends of the best ones to find a mixture that suits your engine best. The diagram shows still with ice or water cooled coil. An accurate thermometer should be used and the heating unit should be controllable to within several degrees.

The first signs of condensation will appear around 170° F. Watch the temperature carefully. Forty per cent of the fuel should boil off under 220° F. (boiling point of water); 75% should be off when 320° F. is reached; 90% under 345° F. and the remainder under 375° F. Nearly all the fuel should be recovered but allow about two per cent for residue. A good general fuel for model work can be mixed from these samples—20% that came off around 200° F.; 65% from the 250° F. range and 15% at 340° F. So you see you can produce nearly any type of fuel you desire.

Now if the combustion of the mixture is too rapid the engine will knock, showing inefficiency besides being injurious to the engine structure. Here the octane rating comes to our assistance. Iso-octane is a clear, colorless liquid that is considered the perfect fuel. However, though a petroleum product, it costs nearly \$25 a

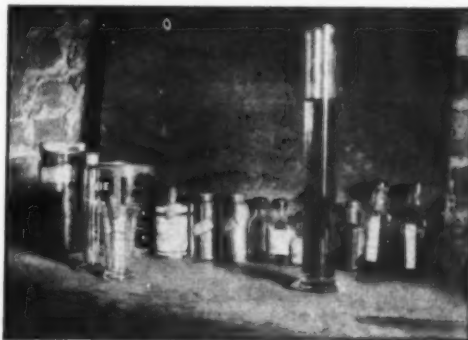
gallon. Normal-heptane, distilled from the sap of a pine tree, is a "black sheep," making an engine sound like a cement mixer. Pure octane is 100% anti-knock while pure heptane is 100% knock. By mixing octane and heptane in various ratios the amount of knock can be controlled. Now: If a sample of gasoline has the same anti-knock properties as a mixture of 87% octane and 13% heptane, then the fuel is rated at 87 octane. But 87 octane, or any other percentage, gasoline does not necessarily contain octane but has the same anti-knock properties as an octane-heptane fuel with that percentage octane.

By adding various substances to gasoline the breaking down of the mixture under pressure may be eliminated. Thus the charge may be fired before the top of the compression stroke so that the last of the charge is burning just at the bottom of the power stroke. It follows that in this way a greater percentage of the charge burns usefully, and consequently there will be more power and efficiency. Of these additional compounds nearly everyone is familiar with tetra-ethyl of lead. On a test engine data was taken on a standard fuel and the same fuel containing ethyl fluid. After the engine was switched to the ethyl fuel the R P M increased, the H P increased and yet the

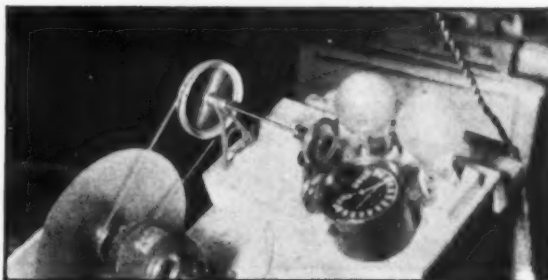
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A motor in the act of tearing off a duration test run

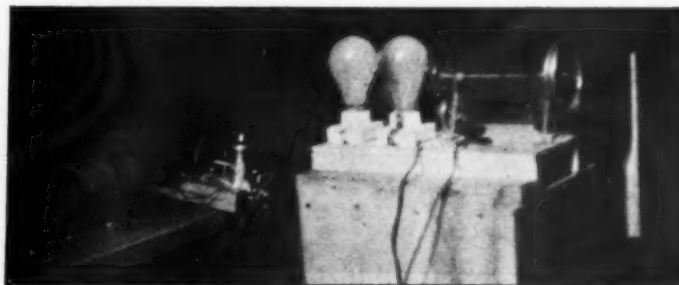


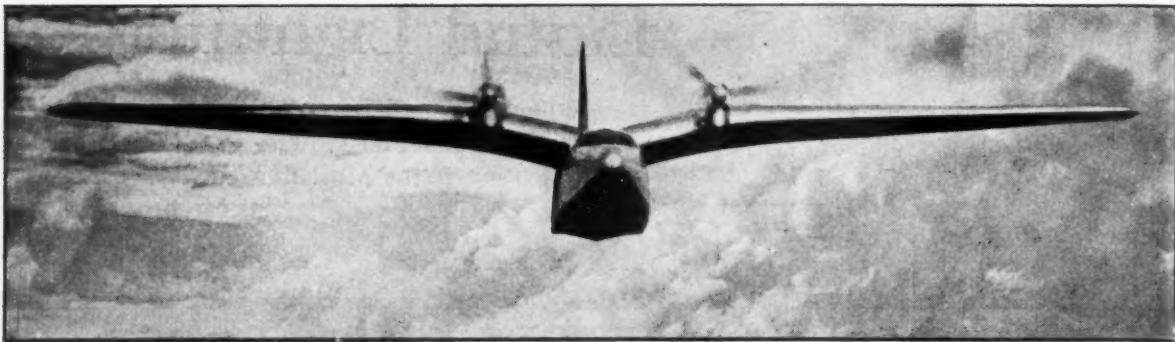
Samples of motor fuel ready for testing



An R.P.M. testing unit showing the scanning disc and other equipment

The complete testing outfit: Scanning disc, speed regulator and motor unit in the author's laboratory.





The new 208 m.p.h. German seaplane with retractable wing floats, for non-stop North Atlantic service. (Monkmeyer)

By ROBERT C. MORRISON

Frontiers of Aviation



The French Trans-Atlantic seaplane that just crossed the Atlantic from Europe though it is five years old. (Arnold)

HERE is an announcement made by the Lockheed Aircraft Corporation which speaks for itself . . . "Its cloak of secrecy cast aside for the first time, the new Vega airplane has been announced in a report made public by the Vega Airplane Co., subsidiary of the Lockheed Aircraft Corp.

"President Mac Short, head of the organization, released first details of the new product. The plane will incorporate the Unitwin engine installation, a new type airplane pow-

er-plant which has been under development for more than three years. Known as the Vega, the plane will be a low-wing monoplane carrying five or six persons, and will generally qualify for the requirements of current airline-type transports. It will be metal structured and have the dual engine power-plant mounted in the nose of the fuselage and geared to a single constant speed propeller.

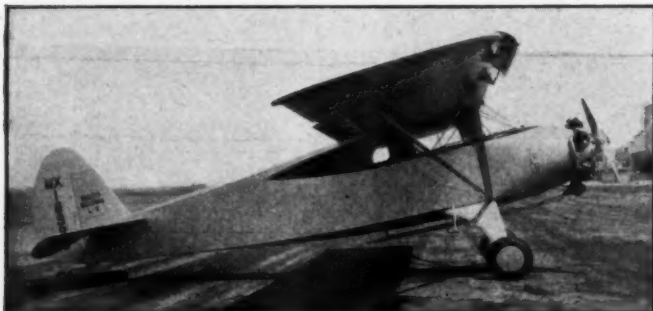
"Wing span of the new plane will be 41 feet. Overall length will be 31 feet, 5½ inches, and the plane will be 9 feet, 1 inch in height. Estimated gross weight is 5411 pounds. Retractable tricycle landing gear will be a feature of the plane, Short said.

"The Vega airplane will follow the general trend of the Lockheed transports produced by the parent Company, and will utilize trailing edge wing flaps, twin rudder and fin tail arrangement and other advanced aerodynamic features.

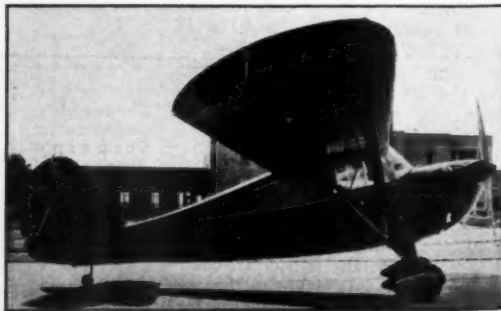
"The Unitwin power-plant consists of two Menasco engines of 260 horsepower each, mounted side-by-side and driving a single constant speed propeller through a new method of gearing. The gear arrangement embodies over-running clutches which operate on the same plan as the over-drive installations in modern automobiles. Through this arrangement close synchronization of the two engines is unnecessary, as they continue to run on the same speed even though the power output of one may be exceeding the other. Likewise, if one engine should stop, the other does not have to work against the inertia of the dead engine. Another feature pointed out by the officials of the company is the fact that by placing both engines in



The Miller H.M.-1, (old "Time Flies") rebuilt for the army competition trials. (Kuster)



Larry Brown's new sportplane. Note the slots and flaps.



The new Aeronca Chief with a Continental engine.



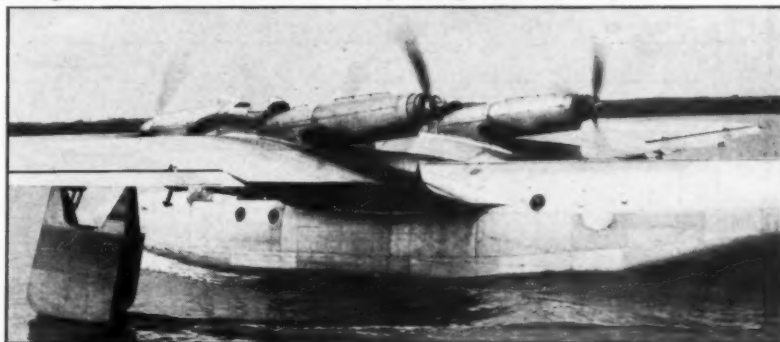
The new Boeing Clipper making a new American record with 77,500 pounds gross load (Acme)

Highlights of the Latest Developments in Aviation—How to Build a Scale Model of Col. Roscoe Turner's Thompson Trophy Winner

one center compartment, excessive drag from the wing nacelles is almost entirely eliminated.

"The body structure of the plane will consist of two main sections. The forward section will be constructed of steel tube truss upon which is mounted the cabin shell fabricated from aluminum alloy. The rear section of the body will be a semi-monocoupe structure of aluminum alloy and will be attached to the steel tube structure aft of the cabin. The power-plant will be supported by a welded steel tube engine mount, removable from the forward structure of the cabin.

"The wing will be of metal and there will be two main panels bolted directly to the fuselage truss. With this arrangement there will be no center section in the airplane. Wing flaps of metal structure and fabric covered will be provided in each wing panel, and in addition, there will be a center section flap of split type metal construction. Ailerons will be fabric covered, with static and dynamic balances. The tail group will consist of an



Rear view of the new German Trans-Atlantic seaplane showing the retractable wing floats and rear motors that may be raised 10° to avoid spray. (Monkmeyer)

all-metal stabilizer, fabric covered elevator with a trimming tab for maintaining longitudinal balance and twin vertical metal tail surfaces mounted at the tips of the stabilizer.

"The two main landing gear wheels will retract into the wing and the nose wheel will be retracted into the engine compartment. Even when retracted all three wheels still provide for emergency landings.

"The cabin is designated after the manner of the modern automobile, two different cabin styles being produced. The cus-



The armed Junkers Fighter-Bomber Gu.87. This plane has been used in Spain. (Monkmeyer)

tom or private owner version will provide commodious comfort for five persons; while the feeder airline version provides accommodations for pilot and five passengers. The cabin will be sound-proofed, heated and ventilated.

"The main baggage compartment will be located below the rear seats, and may be loaded through an exterior door in the side of the cabin. Mail may be carried in the wing adjacent to the cabin.

"Although no performance data is ready for release, President Short indicated the plane will have a top speed in excess of 200 miles per hour and will have a non-stop cruising range of about 1,000 miles. Production of the plane is underway at the Vega plant at the present time. The first plane is expected to be completed about the middle of January."

... And that is the full announcement.

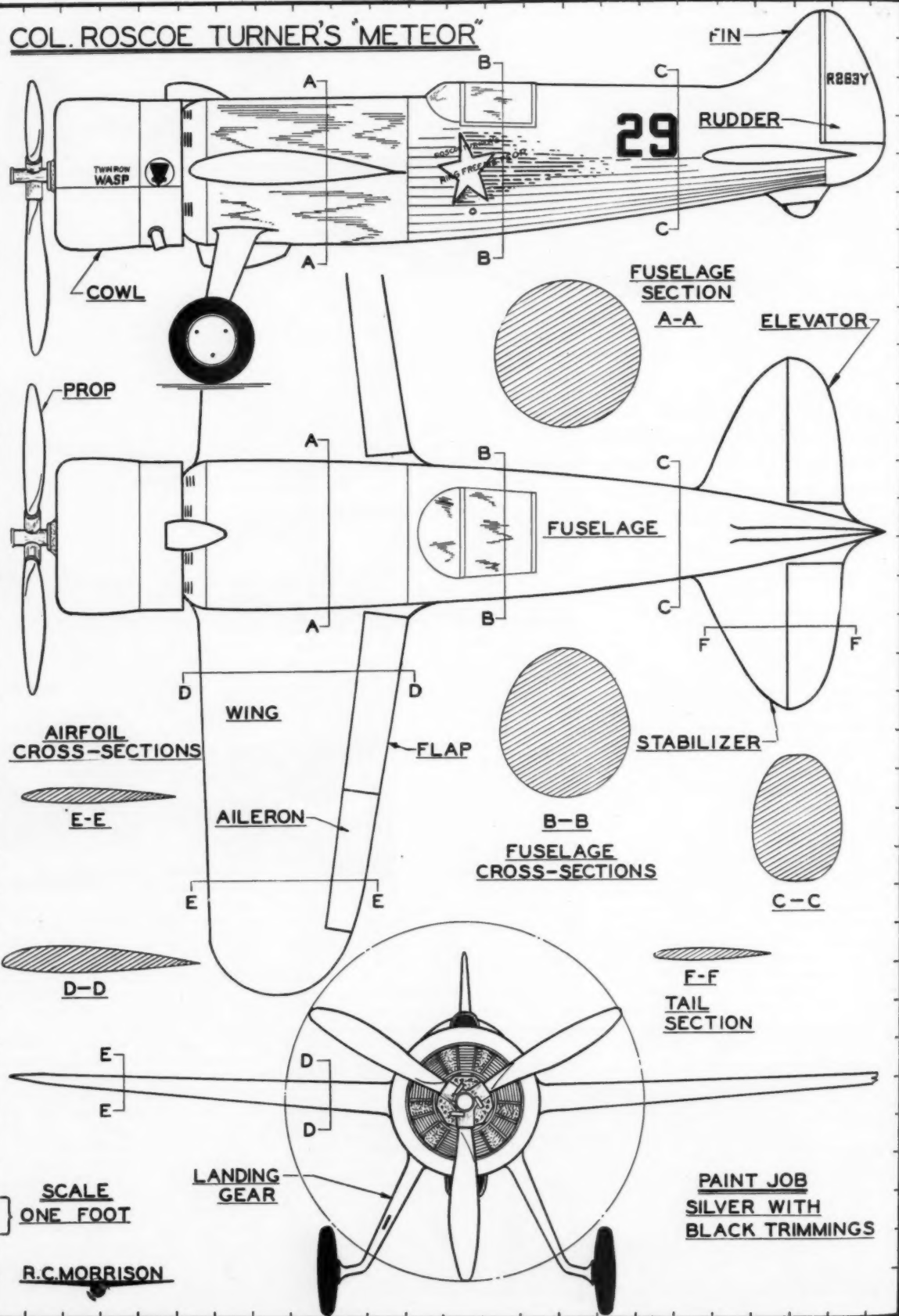
Nothing is mentioned of Fowler flaps

(Continued on page 35)



A Yugoslavian Army plane: a converted German transport. (Globe)

COL. ROSCOE TURNER'S 'METEOR'



Designing Your Gas Model "Prop"

Article No. 80

How to Determine the Pitch, Diameter and Blade Width for Various Engine and Propeller Speeds

Chapter No. 5

By CHARLES HAMPSON GRANT

SO FAR in the discussion of gas model propeller design the calculation of the characteristics of propellers has been based on the assumption that the motor and propeller turn at 4000 revolutions per minute, (R.P.M.). This is the most efficient running speed of most motors. However, some motors develop their maximum power at other speeds. In such cases the values of the propeller characteristics obtained by means of the graphs, tables and formulas given in previous articles, would be inaccurate. This is due to the fact that as the speed varies the change of power output does not vary in the same relationship with the change in power required to drive the propeller.

The power of the engine varies directly with its R.P.M.s up to a certain limit of speed; while the power required to drive the propeller varies as the cube of the R.P.M.s of the propeller. Also, a propeller of a given pitch turning at 4000 R.P.M. would have an entirely different pitch speed if it turned at some other rate.

As the pitch speed of any propeller must be a definite proportion of the level flight speed of the plane upon which it is mounted, this fact is important. The pitch speed of a propeller is the pitch (theoretical) times the revolutions per minute. This should be approximately 50% greater than the plane's level flight speed. In other words, the propeller slip should be about 33-1/3%. If a propeller of eight inches of pitch is mounted on a plane, and it turns at 4000 R.P.M., the pitch speed is 2666.7 feet per minute. If an engine that turns 5000 R.P.M. is installed in this ship, the propeller pitch would have to be only 6.4 inches in order to develop the same pitch speed.

The correct pitch of the propeller which turns at a speed other than 4000 R.P.M., may be determined accurately and conveniently by using the graph on page No. 17 of the November issue, as a basis for calculation. This gives the plane speed and the corresponding pitch to use when the propeller turns at 4000 R.P.M. Then the correct pitch may be calculated by inserting the pitch value taken from the graph in the following formula:

$$P = P_0 \left(\frac{4000}{V_P} \right)$$

P = the correct pitch of the propeller for any specified number of revolutions per minute; P_0 = the pitch given on the graph for any plane level flight speed;

V_P = the number of revolutions per minute at which the propeller will be driven by the engine.

For example, if your plane flies 25 miles per hour in level flight and the normal running speed of the engine is 5000 R.P.M., the correct pitch is found as follows: On the graph a pitch of ten inches is specified for a 25 m.p.h. plane speed. Now inserting the values in the formula, we have:

$$P = 10 \left(\frac{4000}{5000} \right) = 8 \text{ inches pitch.}$$

However this is only part of the story: The required diameter and blade width of the propeller used on the 5000 R.P.M. motor, as well as the pitch, must have different values than the propeller that is used on a motor turning 4000 R.P.M. The question is: How may the correct values of these quantities be determined? As in the case of the pitch of the propeller for the 5000 R.P.M. engine, the diameter may be determined by finding the correct diameter value for a propeller that is to turn at 4000 R.P.M. The correct diameter for any other normal motor speed then may be found by inserting this value in a conversion formula. Let us follow through a practical example to illustrate the procedure.

It was stated previously that the plane flies in level flight 25 m.p.h. A propeller pitch of ten inches is required for such a ship according to the Required Pitch Graph. The next step is to determine what the correct diameter should be for such a propeller; the blade width having a value of one-tenth (1/10) the diameter. The table for correct diameters and blade widths on page 19 will give you this information.

In the fourth double column from the left values for these quantities are shown for various engine powers, under ten

inches of pitch. The diameter specified for 1/5 horsepower is (14.2 inches and the blade width is (1.42) inches. Thus on a 1/5 horsepower engine turning 4000 R.P.M., a propeller should be used having a pitch of ten inches, a diameter of 14.2 inches and a maximum blade width of 1.42 inches when the plane which it powers flies 25 miles per hour in level flight.

If, for any reason you prefer to determine the required diameter and blade width by some other method, you may use the formula appearing at the bottom of column three, page 44, November issue. Simply

insert the value for HP., pitch P, and blade width W_b , and solve for (D), the propeller diameter. The formula is as follows:

$$H.P. = (0.000005) P W_b D^3$$

Inserting the known values, we have:

$$0.2 = (0.000005) 10 \left(\frac{D}{10} \right) D^3$$

$$\text{Then } D^4 = \frac{0.2}{0.000005} = 40,000,$$

$$\text{or } D = \sqrt[4]{40,000} = 14.15 \text{ inches}$$

Thus by means of the formula, the correct diameter has been determined as 14.15 inches. These values are approximately the same as those given in the table.

Now by means of a conversion formula, in which these values are inserted, the correct value may be found for the diameter of a propeller to be mounted on a 1/5 horsepower engine, the normal running speed of which is 5000 R.P.M. The formula is as follows:

$$D_2 = D_1 \sqrt[3]{\frac{P_1 (V_{R1})^3}{P_2 (V_{R2})^3}}$$

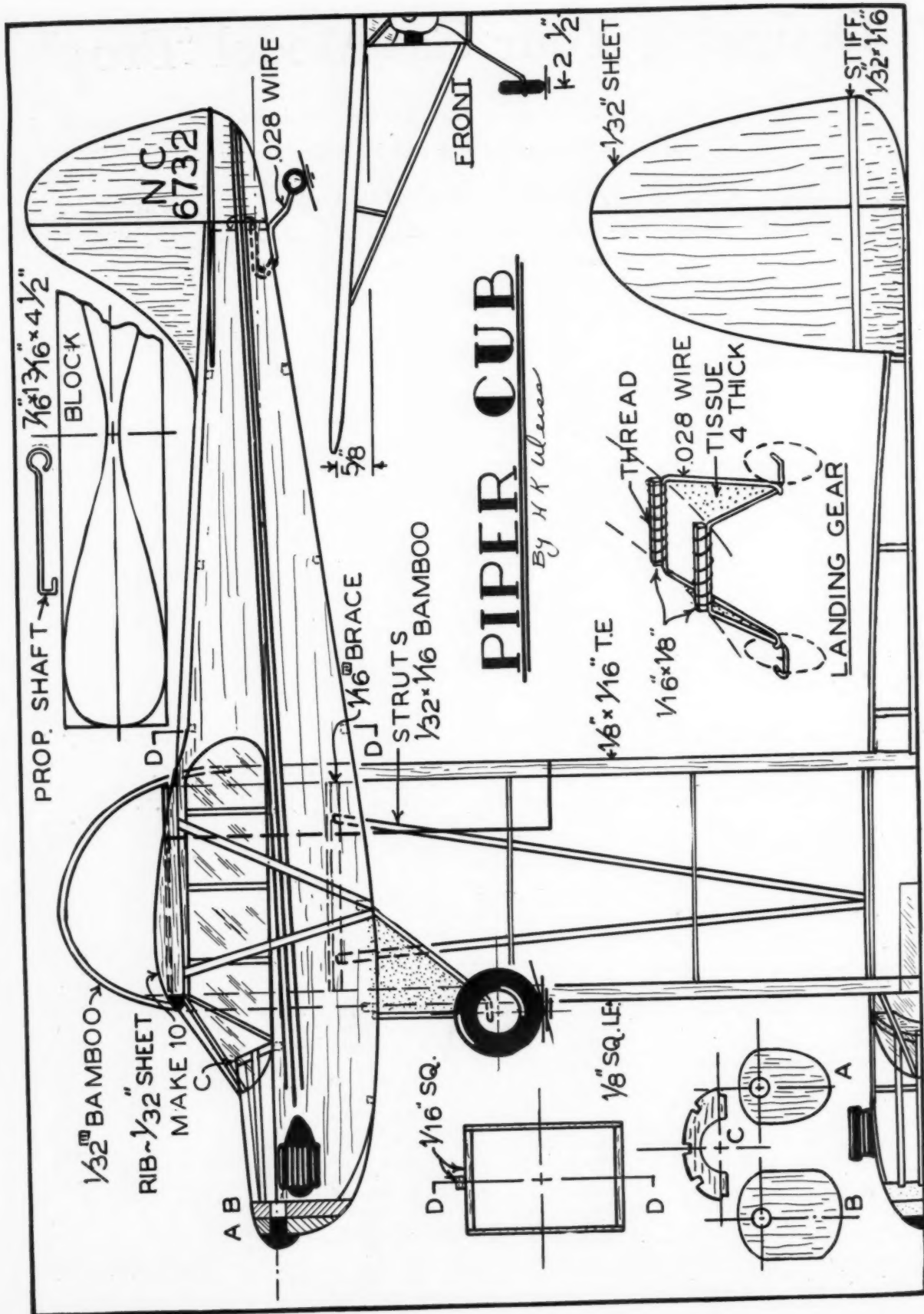
In the formula: D_2 = the diameter; the propeller should be at 5000 R.P.M.; D_1 = the diameter specified at 4000 R.P.M. = 14.2; P_1 = the pitch of the propeller at 4000 R.P.M. = 10 in.; P_2 = the propeller pitch for 5000 R.P.M. = 8 in.; V_{R1} = (R.P.M.) of the old propeller = 4000; and V_{R2} = (R.P.M.) of the new one = 5000.

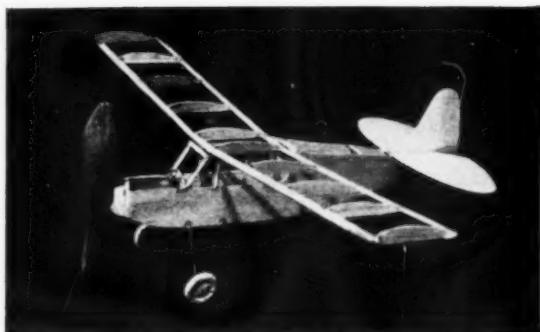
(Continued on page 67)

DIAMETER=TEN TIMES BLADE WIDTH

PITCH	H.P.	Cu	6 in.		8 in.		10 in.		12 in.	
			D	WB	D	WB	D	WB	D	WB
1/5	0.8	16.1	1.81	15	1.5	14.2	1.42	13.5	1.35	
1/6	0.5	15.4	1.54	14.3	1.43	13.5	1.35	12.9	1.29	
1/7	0.42	14.8	1.48	13.7	1.37	12.9	1.29	12.3	1.23	
1/8	0.37	14.3	1.43	13.3	1.33	12.5	1.25	12.0	1.20	
1/10	0.30	13.5	1.35	12.6	1.26	11.9	1.19	11.5	1.15	
1/15	0.20	12.3	1.23	11.4	1.14	10.7	1.07	10.2	1.02	
1/20	0.15	11.5	1.15	10.6	1.06	9.8	0.98	9.5	0.95	

Table of (D) and (WB) Values to use with various Pitches and Engine Powers at 4000 R.P.M.





The framework completed but uncovered



The completed model ready for flight

Build the Piper Cub Minute Model

Here Is a Simple Model of a Popular Sportplane That May Be Built in a Few Minutes
Yet Which Will Give Exceptionally Fine Performance

By HERBERT K. WEISS

AMERICA'S most popular airplane to-day, the Piper Aircraft Corporation's "Cub," is the first ship to really break into the vast potential market of the air-minded public. The Cub is not yet a "thousand dollar airplane," but it is very near to it. With dual controls in an effectively furnished cabin the Cub seems to be giving its owners what they want, as is evidenced by the fact that over a third of all commercial airplanes sold today are Cubs.

Most significant in view of the large volume of Cub sales, is the fact that the Cub's top speed is only 84 miles an hour—fine for such a low powered ship, but nevertheless indicative of the intention of Cub owners to fly as they would drive their cars, safely and with economy.

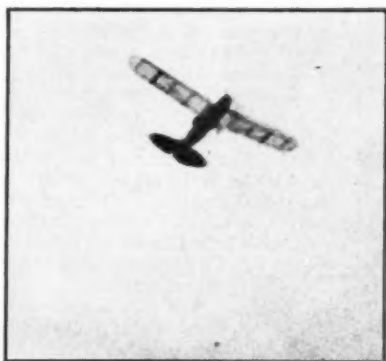
Both aviation and the automotive industry owe much to the first wild spirits who burned the road and air in tricky experimental contraptions, but their number has always been small. A greater development from their beginnings requires the support of many enthusiasts. The Piper Corporation is leading the way in introducing to aviation a large and permanent group of supporters, to the eventual benefit of everyone concerned with aviation.

Our model this month has been designed for extreme simplicity. Because of the light construction, it flies very well.

Fuselage:

With a sharp razor cut out two fuselage sides from 1/32" sheet balsa. The outline can be traced on the balsa by putting a sheet of carbon paper under the plan with the balsa under the carbon, then tracing the plan lightly with a sharp pencil. The rudder and stabilizer can also be traced and cut out of 1/32" sheet balsa at this time. Sand the pieces smooth on both sides with fine sandpaper.

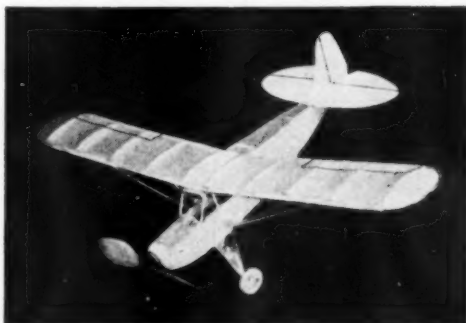
Now cement the two fuselage sides together at the tail post, using a short piece of 1/16" square balsa as the tail post. Cut out former C from 1/16" sheet balsa, and A and B from 1/8" sheet balsa.



Coming in! (Actual flight)



Climbing for altitude



The little ship is most realistic. Sheet balsa makes the construction simple

Cement the cross braces in place just at the rear of the windows, and follow these with the 1/8" x 1/16" braces at the landing gear. Add former C. Cement A and B together, and attach them to the nose of the fuselage as shown on the plan, using pins to hold them in place until the cement is dry.

Add the remaining cross braces, the tail hook and the landing gear.

Note that the landing gear is all wire, covered with four sheets of tissue.

Wing:

The wing is of standard construction. Make it in one piece, leaving the leading and trailing edge in rough form, and sanding them to airfoil section after assembly. The bamboo wing tip can either be bent over a candle flame, or as the bamboo bends freely, simply bent and tied into place with thin thread while the cement is drying.

Assembly:

Sand the wing and fuselage again to remove any projections which would spoil the covering. Then cover them carefully with tissue. Colored tissue may be used in any color scheme to suit the individual builder. Spray the covered parts lightly and allow them to dry. Sand the "fuzz" from leading and trailing edges and tack down loose edges of tissue with dope.

Now cement the wing to the fuselage, scraping the tissue from the frames at the joint so that the cement can hold the balsa. Add the tail surfaces, wing struts and wheels. The tissue-covered parts can now be given a coat of very thin dope if desired.

Carve the propeller from a block of medium hard balsa to the size shown.

Flying:

The original model flew very nicely on two strands of 3/32" rubber, using about an inch of slack with a winder. A heavier model will need two strands of 1/8" rubber, and can probably take almost two inches of slack. The potentialities of these small models are surprising. Our Cub flies half a minute consistently indoors and rides

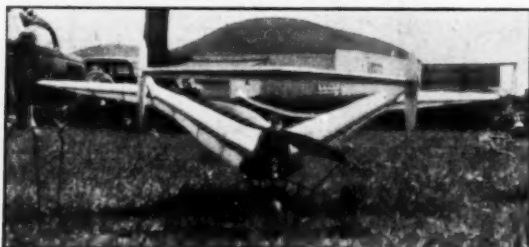
(Continued on page 35)



Pict. No. 1. A biplane gas model in full flight at Daytona Beach



Pict. No. 2. Ben Shereshaw and his new motor



Pict. No. 3. An agitated sea-gull? No, only a gas model, believe it or not; built by Warren Robinson



Pict. No. 4. This ship by Elbert Weathers drops its gear after a take off. A landing wheel protrudes from the fuselage



Pict. No. 14. A twin engine seaplane at the Philadelphia meet



Pict. No. 13. Do our eyes deceive us—a model Douglas DC-3

"Gas Lines"

Official Section of the National
Aeronautic Association Gas
Model Division

NATIONAL
AERONAUTIC
ASSOCIATION
HEADQUARTERS NEWS

THIS is the last call to all members of the old I.G.M.A.A. who wish the gas model pioneers' certificate, which shall be issued shortly. All that is required of you is that you send in your name and address and when you became a member of the association. All old members who do this will receive their certificate in a short while. This certificate is being given in order that all former I.M.G.A.A. members may have a testimonial of their pioneer efforts in gas model aviation. All those who receive certificates will be listed as members of the Gas Model Pioneers, a permanent association without dues.

The plan is that members of this society will get together from time to time to discuss gas model problems, past experiences and enjoy association with one another. This offer is open until January 1st. After that date those who have not requested certificates and verified their claim for one, will be ineligible for the new association. We advise you to take action immediately!

A flood of news has come into "Gas Lines" from all parts of the country; so in order to cover the ground completely each item will have to be taken up in brief form. We see that Florida is placing itself on the map in the gas

model world. Mr. Charles A. Faraldo of 634½ Mulberry Avenue, Daytona Beach, Florida, writes and tells us that a very large contest was held at Daytona Beach recently, which two thousand people attended. Mr. Faraldo acted as contest director. Picture No. 1 is an unusual shot showing a gas model biplane taking off from the run-way and gaining altitude rapidly. As most gas model builders will realize, this is out of the ordinary; for it is exceedingly difficult to build biplane gas models that perform with a normal degree of stability.

Picture No. 2 shows Ben Shereshaw of the Kresge Model Aero Club, Newark, New Jersey, holding a ship in which is mounted his newest creation; a gas engine of the midget variety. The piston displacement of this engine is approximately .24. We understand that it performs remarkably well and has plenty of power.

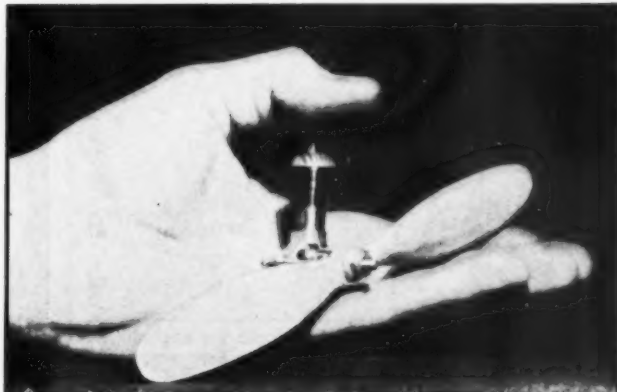
Some model builders become very bored with the continual building of orthodox planes. One of these is Warren Robinson of 4922 North Kildare, Chicago, Illinois. He likes to try new ideas and take voyages of discovery through gas model design. Look at picture No. 3 and see what he found on a recent mental sojourn. Robinson calls this a "vacuplane." As you can see, it has a gulled wing. The stabilizer is located at the front of the plane on two outriggers. He says:

"I had quite a little trouble in balancing it due to the center of lift being far forward. It flew best with a two wheel landing gear and stabilizer in the rear of a fairly heavy nose weight."

Evidently Robinson has been testing various combinations, and is now redesigning it and is sure it will be a success. The wing span is four feet.



Pict. No. 5 Larry Thirkelsen inspects record model built by Ira Hassad and Mel Anderson. Ralph Hall, right



Pict. No. 6 The smallest motor in the world in the hand of its builder, Owen Chapman. The propeller is only 6" in diameter

Here is something that appears to be quite new in gas models. It comes from Elbert J. Weathers of 2720 Poinsettia Drive, San Diego, Calif. It is a gas model which drops its landing gear after the take off. There is one single wheel protruding from the lower part of the fuselage on which it lands at the end of the flight. The ship is shown in picture No. 4. As usual with Weathers, the general design characteristics are graceful and efficient. Unfortunately though, such a plane cannot be used in a contest; for it is against the NAA rules to drop any part of the ship when it is in flight.

In his letter accompanying the picture Weathers states that the landing gear is not part of the plane but merely a "dolly or cradle." We beg to differ with him in this respect, inasmuch as the landing gear performs the take-off function of the ship; without it the ship would be inoperative. Therefore it is a necessary, functional part of the ship. Whether it is a part of it *structurally* is not the question. If what Mr. Weathers says was true, there would be nothing to prevent the model builder from dropping part of the motor unit, such as the batteries, etc. after the engine stops so that the ship would have better gliding qualities due to less weight. Any part of the structure, or object which enables the plane to get off the ground, must be considered as an integral part of the plane.

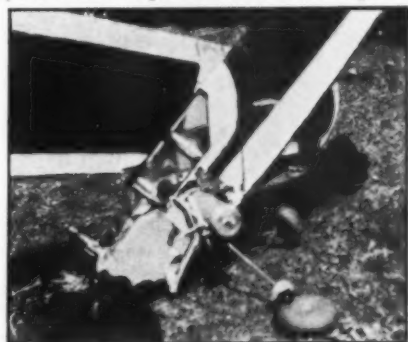
Mr. Weathers mentions the fact that he has had the method of applying this idea copyrighted for seven years. It seems there is nothing new in model aviation—for your editor used this system of take-off for rubber powered twin pushers as far back as 1910. Mr. Weathers continues:

"The builder of this ship has observed on several occasions that when several other one-wheel landing gear jobs have been flown in California (in every case, one wheel retracted with mechanism straight up into fuselage and wingtip supported until off ground), that each one climbs in a vertical bank, losing practically everything gained; and consequently gaining practically no altitude in a certain time period. Therefore, I felt the real answer lay in the application of a generous curved gull, built into the wing center section. In this way, the C.L. has been separated from the C.G. sufficiently so that it contributes much to the normal climbing bank which the ship has. The coil is just below the side cabin windows and the batteries are end-to-end in a case built vertically into fuselage behind the cabin. The C.G. of the model is just below line of thrust and C.L.A. is in proper relation. The gulled wing and up-curved tips have provided for the utmost in stability. The ship has a neutral setting of the stabilizer and wing, and also a neutral line of thrust.

"It flew under power and glided perfectly from the very first test flight, and has flown exactly as calculated on paper. On the glide, it really eats up the raisin currants and for that reason doesn't even 'come down for lunch.' You will notice that the wing loading is .90 lb. per sq. ft., which doesn't bother it materially.

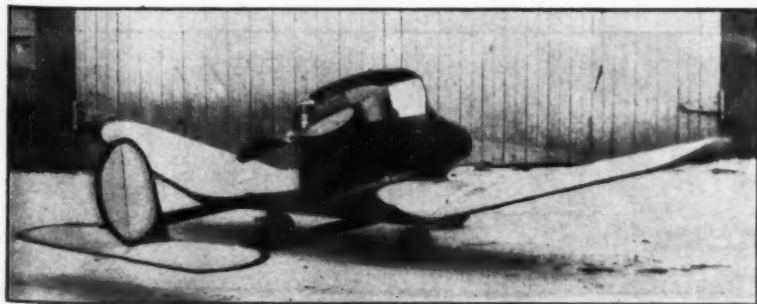


Pict. No. 10. Only a gas model, no fooling, of the Dornier DO-18; built by Ed Radtke. It performs like a real ship too

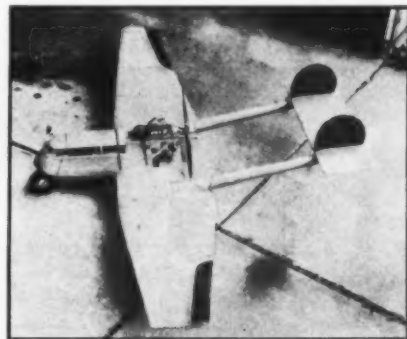


Pict. No. 9. At the end of a perfect flight

However, it will be recovered shortly and given a lighter paint job at which time it won't exceed 3.5 lbs. which will give a 12 oz. loading. This is another application by the writer of the Grant XG wing section and it offers everything plus in the model's performance. The paint job consists of an aluminum paint that is so bright that it looks similar to chromium plating, and at times when aloft in the



Pict. No. 7. A realistic low-wing gas buggy by Harry Durant



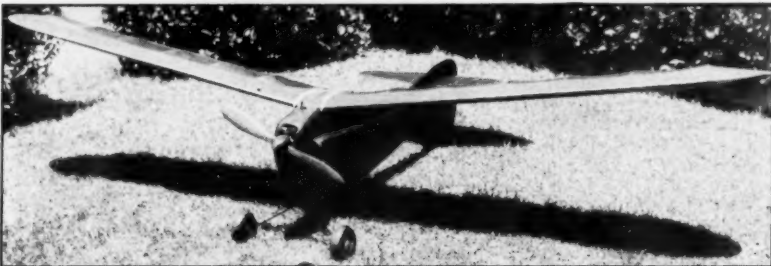
Pict. No. 8. Scott Pearson's low-wing



Pict. No. 19. Carroll Krupp of Akron with his one wheeler



Pict. No. 18. Bud Champman of Cal. on the field at Akron



Pict. No. 11. One of the sleekest jobs we have seen, by Burnett Gadeberg



Pict. No. 17. Will she or won't she?—Yes!

sun the model is just a blinding flash. "The ship carries a Univex Model 'A' camera (as used on WESTERNER in May-June '38 issues) mounted over the fuselage on the wing center section, which is readily attached when desired. It is mounted with the lens facing the tail surfaces and will include them in every picture, but has not been used as yet. A high grade film is now available for Univex cameras at 15c a roll which will improve the quality of aerial photographs."

In California gas model builders are

going after unlimited endurance flights in a big way. Picture No. 5 shows Mel Anderson and Ira Hassad of Los Angeles with a plane they built which established an unofficial duration record for unlimited fuel of two hours, one minute, fifty-four seconds. Mel Anderson, who materially contributed to the success of the flight, is discussing the event with Larry Therkelsen, timer, and Ralph Hall, pilot of the Stinson which followed the model. Now, however, we hear from Mr. Bill Atwood, also of Los Angeles, that he has just broken this unofficial record by making a flight of over two hours, forty minutes. Mr. Mel Anderson, on his flight, used a Baby Cyclone engine; Mr. Atwood used an Atwood Phantom.

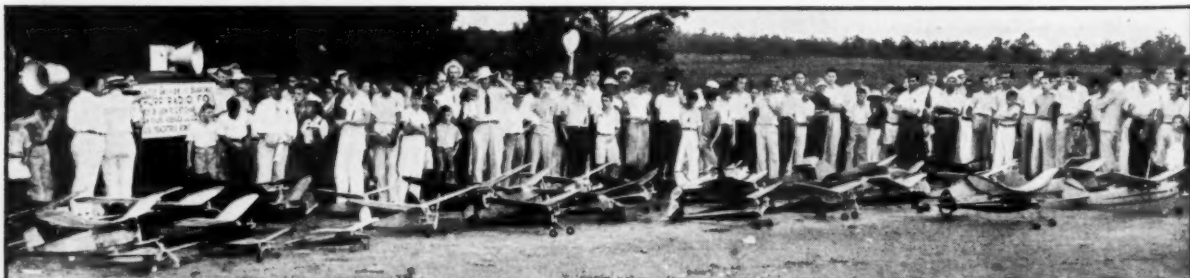
Mr. Owen Chapman of 4616 Lincoln Avenue, Los Angeles, Calif., sends us information about what we believe is the smallest gas engine that has been produced to date. It is shown in picture No. 6 in the hand of its creator. It has a bore of only 5/16" and a stroke of 11/32". The engine alone weighs 3/4 ounce and turns

a six inch propeller at 5000 revolutions per minute. The cylinder is machined from tool steel hardened and ground; the finned head is made from aluminum. The spark plug insulator is of Pire tubing. All parts of the motor were machined on a lathe that has a swing of eighteen inches and an eight foot bed, driven with a one cylinder concrete mixer engine.

For the benefit of those who are not machinists, we wish to say this is some feat; and parallel to repairing a watch with a monkeywrench!

Here we have another unique ship; built by Harry Durant of 2517 Purdue, W. Los Angeles, Calif. It is shown in picture No. 7. As you can see, it is a low-wing similar to some of the entries in the Department of Commerce's fool-proof airplane contest. The ship flies very well indeed, for pictures of it were submitted which demonstrate its performance ability. Mr. Durant has had plenty of experience in aviation, having been in the Air Corps for twelve years.

In picture No. 8 we have another low-wing plane of excellent flying qualities; built by Scott Pearson of 1224 Park Place, Quincy, Illinois. He tells us that it is basically a Hammond Y; and that his father and he flew it thirteen times, each flight lasting from one to three minutes. This was done without breaking a single part. He says the center of gravity is too far forward and because of this the glide is steep, so they are now taking steps to correct this by moving the center of gravity. A hint may be given here in respect to low-wings: The wing should be at approximately zero degrees with the line of thrust, and the stabilizer at from one to two degrees negative. This will induce a nosing-up effect on the glide rather than a tendency to pitch forward. The wing spread of the ship is fifty inches, and it weighs 2-1/2 pounds; with a wing loading of ten ounces per square foot. An inverted Husky Junior engine is used.



Pict. No. 15. They are interested in models in Atlanta too. A line-up of contestants in a contest held there



Pict. No. 20. R. to L. Maj. Al. Williams, Walter Good and Bud Chapman examine one of the winning planes at the 1938 Jr. Air Races

If you have sensitive feelings we advise you not to look at picture No. 9, for it is one of the sad moments that occurs in the life of every gas model builder at some time or other. Let it serve as a caution to have your plane carefully adjusted for the take off and all flight conditions perfect.

We note the batteries protruding from the wreckage on the fuselage side. This might have been avoided if a demountable or detachable motor mount had been used. In other words, complete demolition of the ship in crash-landings may be reduced to a minimum, if not eliminated entirely, by correct structural design. Many ships are just built without any thought to stresses involved, and invariably they have some weak point which gives way under such conditions as shown. Ships properly designed will take unbelievable abuse, so if you wish to avoid rebuilding your ship after every flight or so—"think before you build it." The unfortunate owner of this plane is Roger W. Maves of 2136 Penn Avenue South, Minneapolis, Minnesota. He says that before the crash the ship made many good flights and was a very stable flier. A strong wind was its undoing.

In picture No. 10 we have a very unusual plane. It is an exact scale model of a German Dornier DO-18. The ship was built by Ed Radtke of 3731 North 24 Place, Milwaukee, Wisconsin. It has a 6-1/2 foot span, weighs 4-1/2 pounds and is powered by a Bunch Mighty Midget engine. It was designed from drawings and photos received direct from the Dornier factory.

Burnett Gadeberg of 2315 Corona Court, Berkeley, Calif., sends us picture No. 11 of his latest design, which is certainly a beautiful job. He says that from tests he has found the strength-weight ratio of the wing is 60/1. The span is 72 inches and the aspect ratio, 7.2. Mr. Gadeberg writes of his plane:

"The cowling is a

true N.A.C.A. air-flow fairing and it is used for flying not for 'looks'

The total weight is 45 ounces and even though it is under powered with a Mighty Midget it has a steep climb and a flat glide and responds to even the slightest thermals. It should do well in contests, for which it was designed.

"The single strut landing gear serves a double purpose. First, to absorb and transmit landing shocks in a smooth, even flow to the fuselage to prevent bouncing from side to side and ground looping (which it does excellently) and, second, to form part of the internal diagonal bracing. From the point of entry the struts run diagonally upward and backward until they intersect the motor bearers. Along with a heavy three-ply fire wall these form a very rigid triangle. Every stress in the ship, either flying or landing (even if this is not done on the wheels), is transmitted to this triangle; since the batteries, coil, motor, fuselage, landing gear and even the wings are fastened directly to it. In the event of a crack-up the batteries will not sail out the bottom of the fuselage."

Mississippi Valley Contest

Airplanes crashed one after another at Parks Airport in East St. Louis, Illinois, on Sunday, August 14th, as 328 model airplane enthusiasts, in the face of a 20-mile wind, competed for the 52 prizes in the Sixth annual Mississippi Valley Model Airplane Contest, sponsored by the Stix.



Pict. No. 16. The busy workshop at the Parks Air College Model Club. Principles of design are learned by building models

Baer & Fuller Department Store, the Young Men's Division of the St. Louis Chamber of Commerce and Parks Air College.

Crashes were 50% greater than in previous years and, because of the strong wind which didn't die down until late in the evening, no records were broken. Yet all in all, the meet was highly successful, and Contest Director, Bob Sommers (who, incidentally, announced his engagement the very day of the contest), may well be proud of the results. Contestants had come from Arkansas, Tennessee, Iowa, Florida, Wisconsin, Illinois and many other states—and most of the top-notchers in model aviation were represented.

Carl Goldberg of Chicago won the gasoline model endurance contest when his plane remained in the air for 2:22 minutes. Karl Schuenke of Milwaukee was second and Frank Nekimken of Chicago third. The gasoline performance contest, judged on take-off, flight and landing, was won by Roy Marquandt,

(Continued on page 56)



Pict. No. 12. Part of the crowd that attended the Mississippi Valley Contest. For them models hold more thrills than the large plane. A Curtiss Robin gas model is in the foreground

The Physics of the Airplane

An Explanation of the Cause of Forces in an Airplane Created by Circular and Periodic Motions

By LT. JAMES EAMES and WILLIS L. NYE

THE flight path of a modern airplane when executing a vertical bank is a representative example of curved motion. The aeronautical experimenter is accustomed to graceful lines, proportions and motions. Good examples of these are found in the profile curves of modern airfoils, the sleek fairing lines of modern airliners and the maneuvers of a modern airplane during a demonstration of aerobatics. This predilection for geometrical curved lines of fair proportions is attributed to the fluid characteristic of the airflow about the airplane and its path when the structure is subjected to external forces which cause it to maneuver as a body immersed in a fluid medium.

Speed is essential to cause the wings to generate a lift force. The speed element consequently causes the structure to be subjected to certain accelerations and forces. We know that when the airplane flies in a circuitous path of continuous progression and uniform altitude, and if it always passes over an equal linear distance in an equal interval of time, it may be assumed to have completed a period of circular motion of uniform constancy. A maneuver such as this is commonly presented to student pilots in solo flight practice. The magnitude of the airspeed is assumed to be constant. Nevertheless, the airplane in its direction of flight is continually changing in banked flight. We say that the structure is experiencing a definite degree of acceleration. The acceleration is a result of the continuous change in the direction of flight.

It may be taken for granted that a certain force must be applied to the controls to cause a banked, continuous, circular flight in the direction of the motion of the airplane similar to that of the force which is necessary to cause a variation in the airspeed. If the airspeed is not increased, the external force which is applied causes only a relative change in the

direction of motion. This force acts in a line which lies at right angles to the direction of the motion along the circular path. The force acts in a direction which is coincident with the radius of the turn and tends to act in toward the center of this imaginary circle in which the airplane is assumed to be flying. The motion in a true example of circular flight must be continually changing and the force which causes this change must be constant. This force is a centripetal force acting inward and is equal to the centrifugal force acting outward, caused by the mass of the airplane.

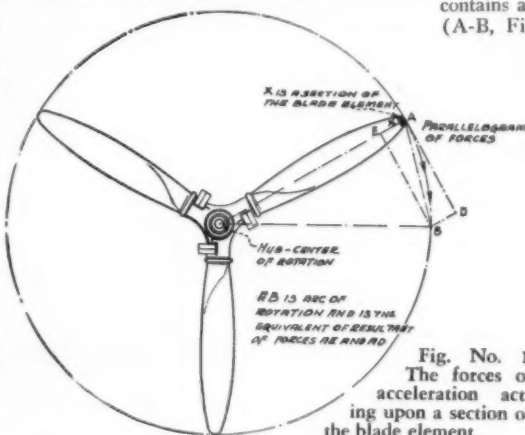


Fig. No. 1.
The forces of acceleration acting upon a section of the blade element.

form circular motion. For example, we will consider the mass of a section of the propeller to be concentrated at "X" in Figure 1. This mass tends to experience an acceleration in toward the center when the blades are rotating, regardless of the rate of rotation. This example may be clarified to a further extent by saying that the whole mass of the propeller experiences an acceleration in toward the center of rotation at the hub. This acceleration can be determined by mathematical equations. For the sake of simplicity, it may be assumed that if the outer portion of the blade which contains a specific mass passes over an arc, (A-B, Figure 1), at a constant speed of

rotation and at a specific interval of time during the progress of rotation, it can be ascertained upon inspection of the diagram that the mass concentrated at the outer portion of the blade is deflected from the straight line distance (A-D, Figure 1), through the equivalent distance (A-E). This is so because the action of the constant force acting in toward the propeller hub.

The following equation illustrates how this acceleration in toward the propeller hub may be determined.

$$\text{Constant Speed} = 2 \times 3.1416 \times \text{Radius of Circle} \times \text{R. P. S.}$$

R. P. S.: Revolutions per second.

$$\text{Acceleration toward Hub} = \frac{4 \times (3.1416)^2 \times (\text{Radius})^2 \times (\text{R.P.S.})^2}{\text{RADIUS}}$$

Note: The value of the radius should be in inches.

The acceleration of the mass at the tip tends to increase as the diameter of the propeller is enlarged or if the number of the r.p.m. per minute is increased. This illustrates the problem of structural design where the strength of a thin blade element of airfoil cross section rotates at curvilinear speeds close to 1,000 feet per second at the extremity of the blade.

The student flyer practicing his first turns flying solo, experiences certain circular accelerations if he rolls into the banked position too quickly or if he tends to overcome the inertia of the moving airplane quickly. For example, if the velocity of an airplane is 120 feet per second and the radius of the turn is 1,000 feet, what will be the acceleration acting in toward the center of the imaginary circle in which the airplane is flying?

$$\text{Acceleration} = \frac{(V)^2}{R}$$

$$\frac{(120)^2}{1,000} = \frac{14,400 (\text{f.p.s.})^2}{1,000} = \frac{14.4 \text{ feet per sec.}}{\text{per sec.}}$$

(Continued on page 40)

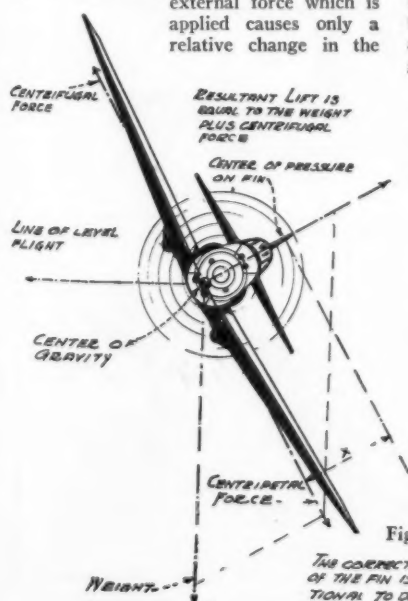


Fig. No. 2. The forces acting on an airplane in a steep vertical bank. (U.S. Air Corps P-37)

THE CORRECTING FORCE OF THE FIN IS PROPORTIONAL TO DISTANCE X

AIR WAYS

HERE AND THERE

What Readers Are Doing to Increase Their Knowledge of Aviation in All Parts of the World. Tell Others What You Are Doing

Air Ways Club News

Original Design Contest

IT APPEARS that scale model builders have been very active recently, for Air Ways Club members have sent us some very unusual "shots" of their handiwork. Picture No. 1 comes from Theodore F. Sharp of 3669 Devonshire, Detroit, Michigan. It is a Northrop A-17 Attack plane, which has been worked out in careful detail and beautifully finished. Though it looks like a solid model, it actually has a built-up frame work covered with sheet balsa. The wing span is twenty-four inches. The motor is a fourteen cylinder twin-row Wasp, made with all the details of the real engine, from drawings supplied by the Pratt & Whitney Company. In the wings are four thirty-caliber model machine guns with a removable hatch above each. A complete system of landing lights and instrument board lights have been incorporated in the model. Another feature is the perforated flaps which you may notice in the picture. This model is certainly the work of a master craftsman.

Joe Walsh of 96 Willis Street, New Bedford, Massachusetts, sends us picture No. 2 of his contest duration model, which embodies the principles used by Vernon Boehle in his 1935 Wakefield job. You will note the high aspect ratio of the wings. Model builders would do well to incorporate this feature in their planes, as it increases the efficiency as well as the stability enormously. The plane has a span of fifty-three inches and a chord of four inches.

Among the finest model builders in the country are the Doering brothers of Los Angeles. Picture No. 3, believe it or not, shows a model Seversky built by these gentlemen. Apparently it is a full size ship either landing or taking off from an airport. The details of the ship and the setting have been so well worked out that it is nearly

impossible to distinguish this model from an actual ship. For this information we are indebted to Mr. V. R. Stiles, 1044 Fairview Drive, La Canada, California, who does all the photographic work for the Doering brothers. He tells us that a replica of the model in the picture has been ordered by an army pilot. The price of the model is \$300.

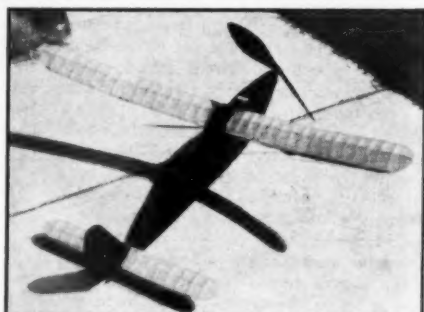
Henry Clark of 46 Fort Washington Avenue, New York City, one of our active aviation photographers, is also a scale model builder. He sends us a picture, No. 4, which shows one of his scale models. He says:

"I recently rebuilt and repainted an old army Boeing P-12 and made it into another type altogether. The result is the ship shown in the picture; a navy Boeing F4B-3."

Examination of this picture will disclose all details of the big ship, many of which builders do not usually include in



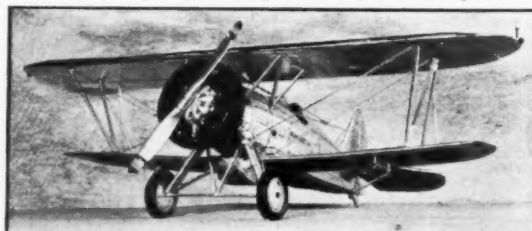
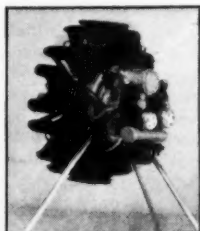
Pict. No. 1. Ted Sharp's perfect built-up scale Northrop A-17



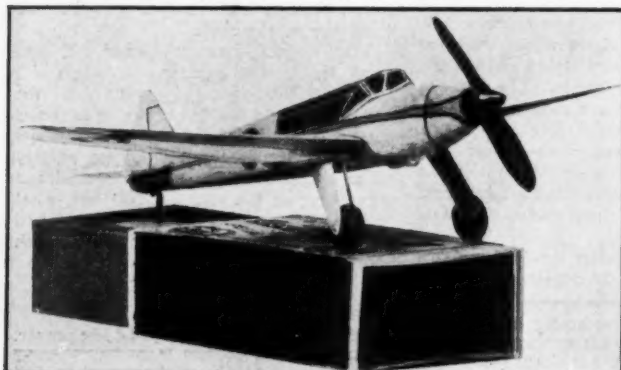
Pict. No. 2. A high aspect ratio duration job by Joe Walsh, a beautiful soarer



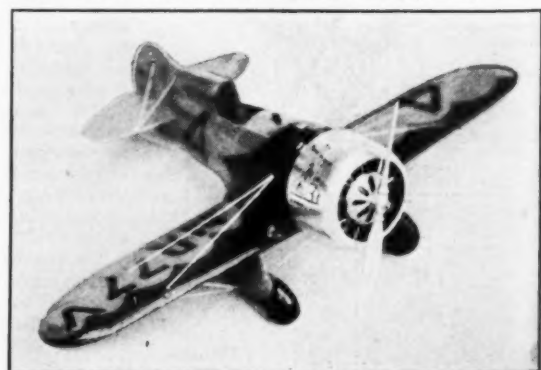
Pict. No. 3. No, this is not a real ship. It is just another perfect model by the Doering Brothers; a Seversky Pursuit



Pict. No. 4 and No. 5. A midget motor and a perfect scale Boeing F4B-4 by Henry Clarke



Pict. No. 9. A paper model you can put in your pocket, by W. Righ



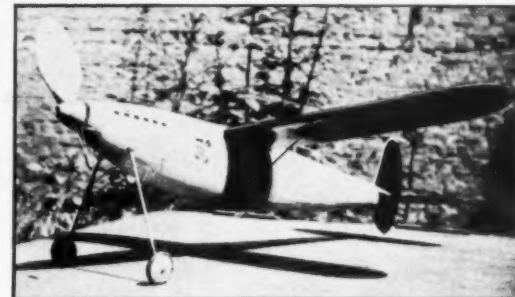
Pict. No. 8. A fine G. B. by Roy Scottine



Pict. No. 11. Members of the Southland Model Aero Club, N.Z.

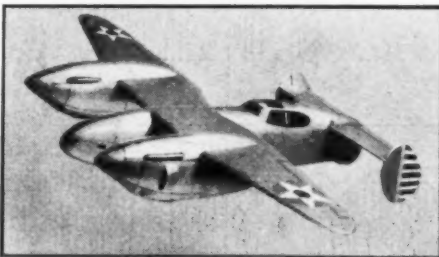


Pict. No. 10. Members of the Lancashire Model Aircraft Society



Pict. No. 12. Alfred Van Wymersch's Wakefield model, voted the most beautiful model at the international contest. It placed third

Pict. No. 13. This is what they do in Russia. Young Soviets get acquainted with model hydros



their models.

Picture No. 5 shows a rear view close-up of a Pratt & Whitney "Hornet" which Henry Clarke also built. The motor is composed of 150 individual parts. Henry puts it rather naively:

"It may not be a knock-out but it certainly is detailed. All parts are balsa except for a reed ignition conducting ring, reed intake pipes and the ignition wires. The push rods are dowel. The complete motor is two and a half inches in diameter."

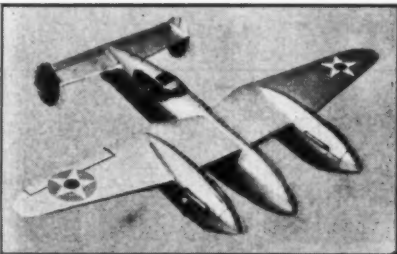
One of the ships of very unusual design that we have ever seen is shown in picture No. 6. It is a Wakefield model built by Ed Seugwoda of 1940 Macdonald Avenue, Brandon, Manitoba, Canada. Seugwoda has solved the problem of the fuselage cross section in a most novel manner. The maximum cross section fills the bill, though the construction has been cut to such an extent that the weight is kept to the minimum. He tells us that the center of gravity is on the same level with the

center of lateral area, and that the ship is of unusual stability and an efficient flier. However, he says on its last flight, at the Winnipeg Contest, the *retractable wing* mechanism worked too well. In other words, it cracked up.

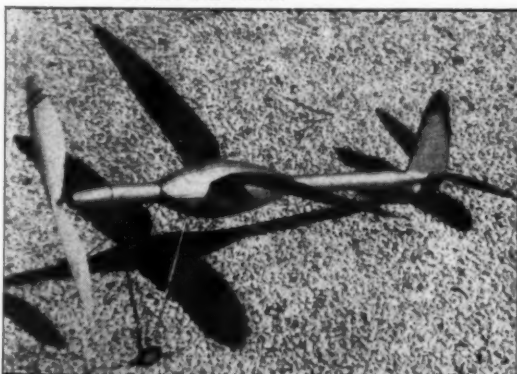
Mr. William Bouldin 3rd of 169 Prospect Street, East Orange, New Jersey, has had another brain-storm; and, as usual, it is a pretty good one. It is always interesting to try something different and to discover new things in the field of design. Lately Mr. Bouldin has experimented with a tandem in which the center of gravity is well back of the trailing edge of the front wing. The tail surfaces are extremely large and carry a major per cent of the weight of the model. Another feature is a single wheel. The two stabilizer fins rise above the ground so that the model remains upright instead of keeling over. It has a span of thirty-four inches; employs an R.A.F. 32 wing section. Actually it is a scale model of the French DeLanne fighter. This latest creation of Mr. Bouldin's is shown in picture No. 7. He says it flew very well on the first flight without much adjustment.

Picture No. 8 shows a model of one of the old Gee-Bees. The interesting part of this ship is that it was built by a ten-year-old model builder, Roy Scottine of 3201 Stockbridge Avenue, Los Angeles, Calif. The youngsters are rapidly progressing in the art of model building. More power to them!

(Continued on page 62)



Pict. No. 14-No. 15. Howard Wolf's solid scale dream ship which wins the Originality Award this month



Pict. No. 6. Ed Seugwoda's unique Wakefield job



Pict. No. 7. Bill Bouldin's one-wheel tandem DeLanne fighter

DRAWN BY
ELBERT J. WEATHERS



AIRCRAFT INSIGNIA OF THE WORLD



12-14-37

KEY TO
COLORS



RED



BLUE



GREEN



PURPLE



YELLOW



BLACK



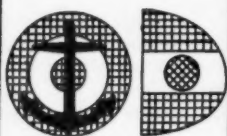
LIGHT BLUE



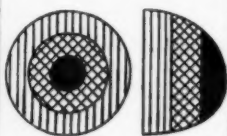
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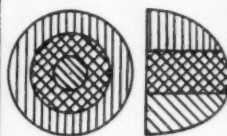
WHITE



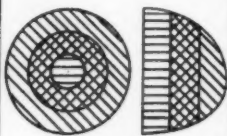
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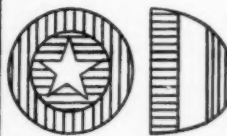
BELGIUM



BOLIVIA



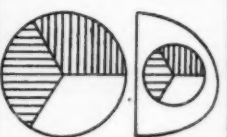
BRAZIL



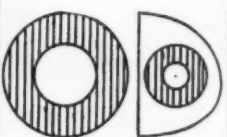
CHILE



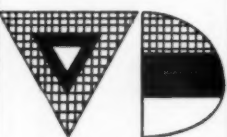
CHINA



CZECHOSLOVAKIA



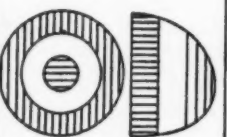
DENMARK



ESTONIA



FINLAND



FRANCE



GREAT BRITAIN



GREECE



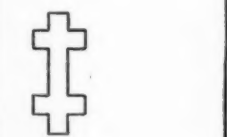
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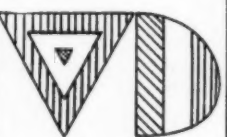
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LATVIA



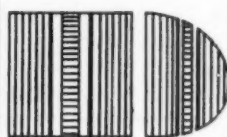
LITHUANIA



MEXICO



NETHERLANDS



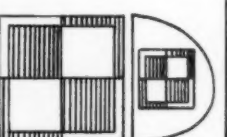
NORWAY



PARAGUAY



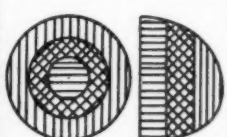
PERSIA



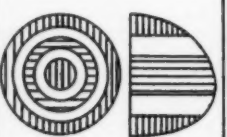
POLAND



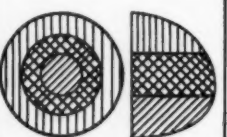
PORTUGAL



ROMANIA



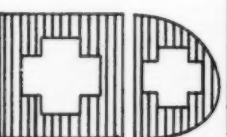
SIAM



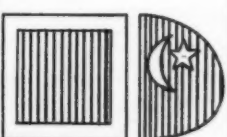
SPAIN



SWEDEN



SWITZERLAND



TURKEY



URUGUAY



UNITED STATES



RUSSIA



YUGOSLAVIA



CUBA

A Gas Model Range Finder

How to Make a Simple Instrument by Means of Which You May Determine the Altitude of Your Model When It Is Overhead

HOW many times have you gas model builders wanted to know the altitude attained by your planes? The writer was interested in that information, so this simple but surprisingly accurate instrument was conceived. It does not operate on the principle of geometric triangulation, as does the type used in military tactics, but functions instead on simple laws of proportion. It has a capacity of 3200 feet, which is plenty of altitude for any gas model.

In examining the scale you will see that a base factor of 25 feet has been selected as most convenient. From "1" to the center, each step (1-2, 2-4, 4-8, etc.) is just half the length of the preceding one. Hence, if a model's wing span is viewed on the ground between 1-1 at 25 feet distance (the chosen factor of proportion) and when the ship is in the air and the wing fills, for example, the space 4-4, the factor (25) is multiplied by four to obtain the altitude; which is 100 feet in this case. As another example, if the wing should occupy in the air the space of 32-32, the height of the gas job would be 800 feet (25×32).

To use the instrument, the observer holds it in such a position in front of him that he may get a good "sight" on the scale with the eyes. The end of the handle is held

By **ELBERT J. WEATHERS**

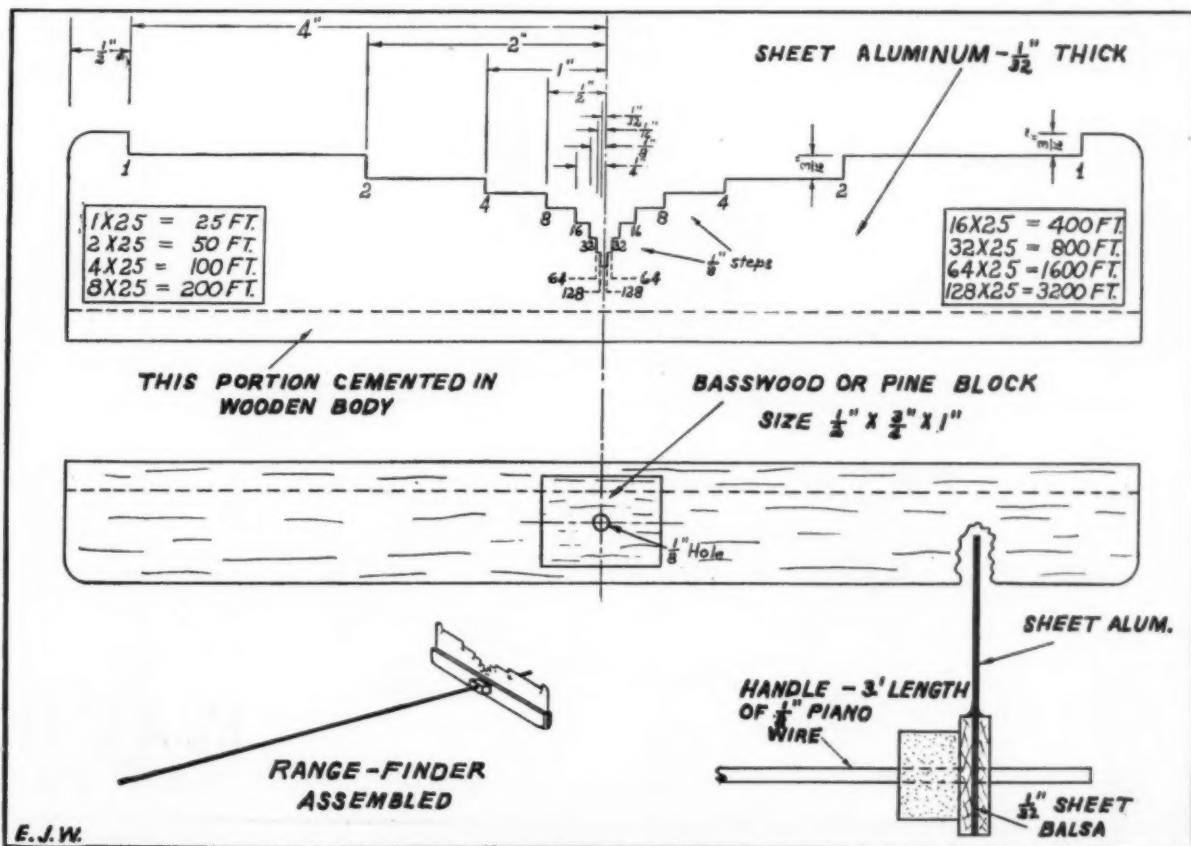
about two inches from the nose, using the right hand. The other end of the handle upon which the sliding cross-member containing the scale is attached, is supported by the outstretched left hand; the fingers grasping the handle from the underside just in front of the sliding scale unit. In using the range-finder, it is important that this position of it in relation to the observer be assumed, both in "sighting" the model on the ground and when it is in the air.

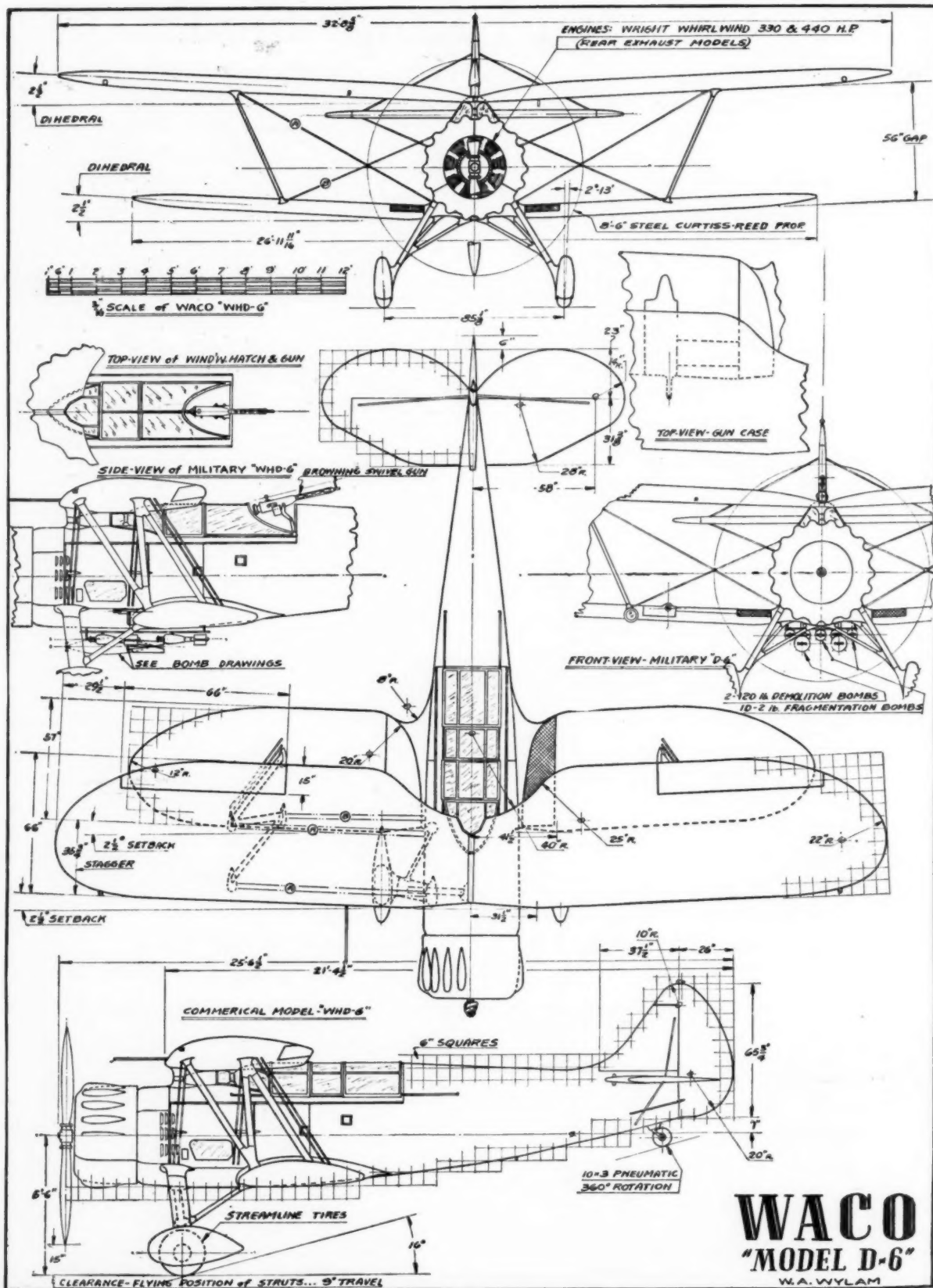
The gas model is placed on the ground in front of the observer at the 25 foot distance, so that a direct front view of the plane is obtained. Now, standing the designated distance from the model and holding the instrument handle about parallel to the ground, "sight" the wing tips and adjust the scale back and forth on the rod until the wing span just fills the space "1-1." It is now ready to use. Proceed to put your ship in the air and when ready to view it as it is circling overhead, with the wingspread in a line across the scale as it was on the ground, take a "sight" on it and quickly note the section of the scale it now fills. If it happens to be "16-16" a hasty glance

at the chart shows the plane to be at an altitude of 400 feet. The figures will of course be rapidly memorized, but for initial trials the user will find the chart of computations handy. Just a word of caution: In using it, the model must be right above the observer with the "finder" in practically a vertical position. Otherwise, should it be used on the plane at an angle of definite value between that of 180 degrees (the ground) and 90 degrees (perpendicular to the ground) quite a little distortion would result in the computed altitude figure, as geometric triangulation would then be involved.

To begin the actual construction, the scale or business part is first made. It is formed from a piece of $1\frac{3}{4}$ " x 9" sheet aluminum of approximately $1/32$ " thickness. Scribe the center line and lay out accurately each station from the center line out to the end of each half. Using this center line of the metal strip as one end of each span of measurement, measure consecutively from $1/32$ "; $1/16$ "; $1/8$ "; $1/4$ "; $1/2$ "; 1"; 2"; and 4". With tinsnips, complete the scale as shown. Now make up the wooden body which supports the metal strip. Secure two pieces of hard

(Continued on page 52)

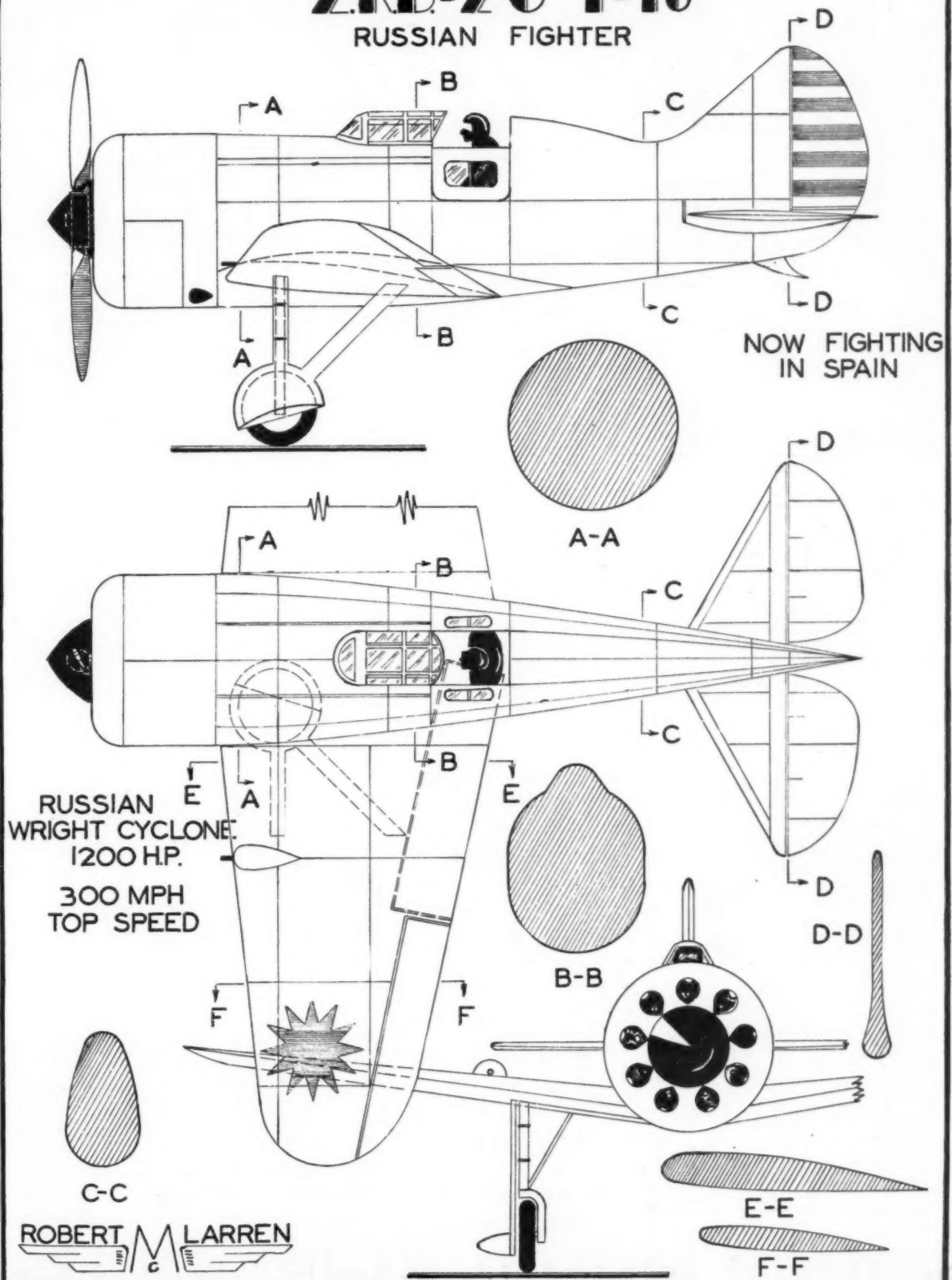




WACO
 "MODEL D-6"
 W.A. WYLAN

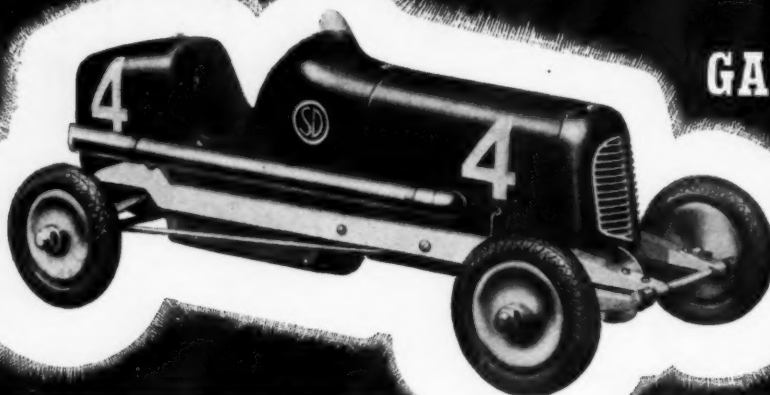
ZKB-20 I-18

RUSSIAN FIGHTER



BUNCH *Presents the* **SPEED DEMON**

GAS POWERED RACE CAR



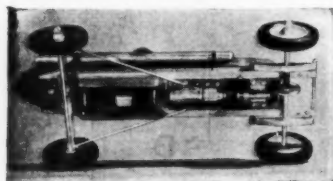
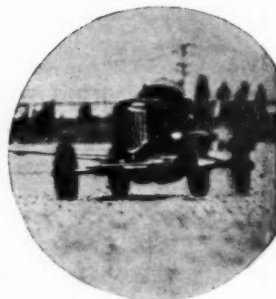
● Now you can own a perfected gas powered race car—the 20" Speed Demon—backed by 2000 miles of racing tests. Designed after the Indianapolis Race Cars the Speed Demon brings you all the thrills, action and excitement of this famous speed Classic.

Any street corner, parking lot, tennis court or playground is your speedway with the Speed Demon. With wheels set to run free or guided with a line attached to the frame the Speed Demon runs in any size circle. The engine is started—the clutch engaged—and the Speed Demon knocks off lap after lap at 30 to 50 M. P. H. (with standard drive ratio).

Not an ordinary model kit, the Speed Demon kit makes up a machine composed of manufactured parts from clutch to air cleaner. All assemblies are built up. Simply bolt together and assemble the car as illustrated. The drive shaft with universal is fitted with bronze bearings in a drive shaft housing. The front axle assembly with front wheel "clutch drive" perfected by Bunch Engineers is machined and finished. Drilled engine mounts bolt to shaped frame rails. Rear axle assembly with radius rods is prefabricated and quickly attached with a bolt. All assemblies and parts are electroplated.

Pneumatic automobile tread tires, wheels, aluminum hood and shaped body and radiator blocks complete the Speed Demon kit so anyone can assemble in a few hours. The ability to build delicate airplane structures or special tools and drills are not required. Complete instructions explain racing methods free from the hazards of airplane crashup.

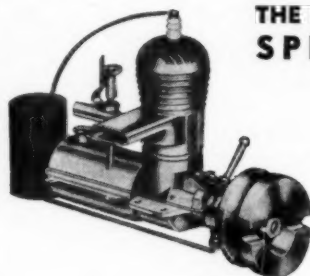
Providing thrills of a full size racer the Speed Demon flashes past, reeling off the laps with the precision of an Indianapolis winner.



Underview of chassis reveals practical front wheel "clutch drive", drive shaft housing, and front and rear axle suspension.



Hood removed shows accessible motor installation. Air cleaner is in cockpit. Adjustable radius rods steer car from rear.



**THE NEW
SPEEDWAY
RACE CAR
ENGINE**

Developed especially for the severe running conditions imposed by race cars the Speedway with special crankshaft and flywheel for automotive drive runs clockwise and has the exhaust on proper side for race car stack attachment. The Speedway—not a stock aircraft engine—is set up with tested clearances and tolerances and equipped with piston rings. A few laps with a race car are possible with many engines, but exhaustive running tests prove the Speedway to stand the "gaff" required of all racing automotive engines large and small. Horse Power $\frac{1}{4}$ at 8500. Bore $\frac{7}{8}$ ", Stroke $\frac{13}{16}$ ".

SPEEDWAY — Assembled.....\$14.00
SPEEDWAY — ENGINE KIT.....\$11.85

Bunch Model Airplane Co.,
5009 So. Hoover St.,
Los Angeles, Calif.

**ORDER
TODAY!**

Enclosed find postal money order. Please rush me:

- ☐ One Speed Demon Race Car Kit
- ☐ One Speedway Engine, Assembled
- ☐ One Speedway Engine, Kit

Name.....

Street.....

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SPEED DEMON

Race car assembly kit —
Complete (less motor) —
immediate delivery.

\$16.50 Postpaid.

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BUNCH MODEL AIRPLANE CO.

5013 SOUTH HOOVER STREET, LOS ANGELES, CALIFORNIA, U. S. A.

British Agents: Model Supply Stores, 17 Brazenose St., Manchester

Build the Piper Cub Minute Model

(Continued from page 21)

the outdoor air very stably. The usual adjustments are made in balancing. If the ship stalls add small hardwood wheels or dope the prop. If it dives warp the trailing edge of the stabilizer up. If the ship stalls under power do not apply down thrust, but instead note the direction in which it tends to circle. Then apply rudder in this direction and warp the trailing edge of the inside wing down to prevent spiral diving, if necessary. The model should then climb in a tight spiral under the initial burst of power.

Frontiers of Aviation

(Continued from page 17)

being used on the plane, and it looks doubtful if such will be the case for the flaps are stated as being fabric covered. The tail of the airplane is in appearance very much like the Lockheed 14's. However, in the proposed design the rudder area will be located in the upper part of the vertical tail surfaces and will not run the full length from top to bottom as on the Model 14. We might add that the total horsepower for take-off will be close to 580 horsepower.

Last month British Airways, Ltd. ordered two more Lockheed 14's to add to the four recently delivered to them. They will use them on their new line from England to Africa, as well as for the 1,000 mile non-stop flights to Lisbon. The company is expanding very rapidly and included in its plans is a route across the South Atlantic. Since British Airways, Ltd. have such close connections with Lockheed and are so pleased with their ships, it is highly possible that Lockheed will be building some larger ships for them in the future to fly the long proposed routes.

Larry Brown, whose last Brown racer bit the dust at Cleveland when the wheels would not come down, has turned to the sportplane field and has test-flown that new ship of his that we have been telling you about. Test flights have been very successful, and the ship has been flown often.

Dimensions and performance data have not been released but on observation we predict the plane will do about 100 miles per hour with a 90 horsepower engine in

the nose. The engine is built by Lambert. The fuselage is of light steel tube design with wood stringers. The nose is metal covered with fabric covering aft. The landing gear is very clean cut and is almost identical to that used on the Sparrow monoplane that made its public appearance over a year ago. If you look at a photo of the plane you will note that the landing gear appears to be rigid. This is not the case however. The landing gear legs pivot where they join the fuselage and the tension load is put into the streamlined wires when the plane is landed. The wires run up to the belly of the ship and are there connected to the shock cords compactly situated under the floorboards.

The wing is of all wood construction with a slight taper in plan and front view which is hardly noticeable. Covering is fabric. The full system of Handley Page slots and flaps has been employed using the linkage system for the slots. The previous Brown low-wing sportplane designed from the racers employed the roller system. This link system, however, is much simpler, and its cost of installation is very low. The lightplane manufacturers should look into this as it may be a means of cutting a good portion of the cumbersome wing area off their ships and adding the slots for safety.

The Brown plane, known as the Beco L-5, is a good plane to step into after the student has had some flying time in the Piper Cubs and the like. It is for the low-priced market and arrangements have already been made for export. Two passengers are carried in tandem style, and the workmanship on the prototype has been excellent. Flaps and ailerons are of the slotted type.

We cannot go without comment on the new DeLuxe Aeronca that has been announced to the public at large. Its quality of construction adds to the story of the lightplane's rapid progress. As the present day Ford is to the Model T, so is the new 1939 Aeronca Model 50-C to the old original cabane-strutted Aeronca. Here are a few of the things to be found in the new ship. . . A top speed of over 100 miles per hour can now be obtained with a cruising speed close to 90 m.p.h. The fuselage is well rounded to give better streamlining and more graceful proportions and is much deeper at the cabin which gives much increased head room. The cabin is also four and one-half inches wider than last year's model. The

LEADING AERONAUTICAL ENGINEERS

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Modern airplane work requires the employment of many experts, each specializing on the solution of one particular problem. One of the most important divisions of this work is in the Design and Engineering Departments, which include laying out the first plans for an airplane, working out new theories, seeing them put in production and then proving them in actual flight.

Train yourself for one of these better positions. Westwood Correspondence School courses contain only essential information and in each course you immediately begin to work out practical aeronautical problems. Let us send you, without cost or obligation, a copy of the booklet, "Specialized Application Brings Greater Success." Check the subject you are most interested in on the coupon below.



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Please send me the booklet, "Specialized Application Brings Greater Success," and full information on the Courses I have checked:

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NAME.....AGE.....

STREET.....

CITY.....STATE.....

N-12

STATEMENT OF THE OWNERSHIP, MANAGEMENT, CIRCULATION, ETC., REQUIRED BY THE ACTS OF CONGRESS OF AUGUST 24, 1912, AND MARCH 3, 1933

OF MODEL AIRPLANE NEWS published monthly at Mount Morris, Illinois, for October 1, 1938.
State of New York [ss.]

Before me, a Notary Public in and for the State and county aforesaid, personally appeared Jay P. Cleveland, who, having been duly sworn according to law, deposes and says that he is the Business Manager of the MODEL AIRPLANE NEWS and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management and circulation of the said publication for the date shown in the above caption, required by the Act of August 24, 1912, as amended by the Act of March 3, 1933, embodied in section 537, Postal Laws and Regulations, printed on the reverse of this form, to wit:

1. That the names and addresses of the publisher, editor, managing editor, and business managers are: Publisher, Jay Publishing Corp., 551 5th Ave., New York City; Editor, Charles H. Grant, 551 5th Ave., New York City; Managing Editor, Charles H. Grant, 551 5th Ave., New York City; Business Manager Jay P. Cleveland, 551 5th Ave., New York City.

2. That the owner is: (If owned by a corporation, its name and address must be stated and also immediately thereunder the names and addresses of stockholders owning or holding one per cent or more of total amount of stock. If not owned by a corporation, the names and addresses of the individual owners must be given. If owned by a firm, company, or other unincorporated concern, its name and address, as well as those of each individual member, must be given.) Jay Publishing Corp., 551 5th Ave., New York City; Y. Kuzni, 551 5th Ave., New York City.

3. That the known bondholders, mortgagees, and other security holders owning or holding 1 per cent or more of total amount of bonds, mortgages, or other securities are: (If there are none, so state.) None.

4. That the two paragraphs next above, giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company as of the date of the filing of this statement, but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also the names and addresses of all owners, stockholders, and security holders who do not appear upon the books of the company as trustees, bondholders, mortgagees, or security holders in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds, or other securities than as so stated by him.

5. That the average number of copies of each issue of this publication sold or distributed, through the mails or otherwise, to paid subscribers during the twelve months preceding the date shown above is not required. (This information is required only for daily publications only.)

Sworn to and subscribed before me this 29th day of September, 1938.
(SEAL)
My commission expires March 30, 1940. LILLIAN D. SCHWOERER.

JAY P. CLEVELAND, Business Manager.

SCIENTIFIC

MODELS ARE IMITATED —
SCIENTIFIC CREATED THE GAS TYPE MODEL
ORIGINAL OFFERS YOU SO MUCH MORE IN



COMMODORE DeLuxe Gas Model

This new Scientific gas model has been designed by the well known "Eaglet" gas model designer, Mr. Ben Sheresaw. The "Eaglet" proved so successful that demands were made by hundreds of modelers for a larger model of this type by the same designer. In this new model Mr. Sheresaw has combined all his knowledge and efforts to build what we believe the finest gas model in America. Listed here are a few of the outstanding features of the "Commodore":

1. Mono Strut landing gear. Designed to insure against nose-overs in the roughest of fields.
2. Stressed to withstand loads twelve times in excess of that occurring in the severest crackups.
3. Differences between power-on and power-off flight altitudes have been cut to a minimum, resulting in the elimination of a critical dip after engine has cut.
4. Absence of spiral dive tendencies.
5. Efficient aerodynamic design resulting in a very flat glide ratio and low sinking speed.
6. Trim flaps for finer adjustments.
7. Semi-monocoque wing stressed to resist all torsion and bending imposed in flights and landings.
8. Semi-monocoque construction throughout wing and fuselage structures.

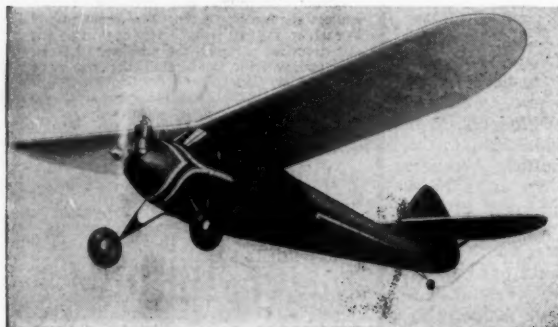
Any inexpensive 1/2 horsepower engine may be used. On many test flights the "Commodore" was powered very successfully with the Brown Jr. Model D engine. Other engines such as the Ohlsson, Midget, Gwin, Deumynte, Synuro, or any other reliable make motor may be used with success.

Kit is 100% complete, including highest quality sheet and strip balsa, finest spring steel wire, all metal fittings, ignition wire, large full size plans with explicit instructions, all necessary liquids, etc., etc.

Complete kit, less wheels.....\$6.95 postpaid
Complete kit, including a pair of 3/4" Scientific Pneumatic rubber wheels.....\$7.95 postpaid



Wingspan.....6 feet
Overall length.....50"
Wing Area.....52 sq. ft.
Total weight with motor and ignition mounts.....3 1/2 lbs.
Airfoil section.....Göttingen 549
Glide Ratio.....16 to 1
Rate of Climb.....Approx. 700 ft. per min.



THE EAGLET

44" Wing
Flying Weight 17 ozs.
Truly the Finest Midget gas Job Offered to the Gas Model Builder Today.

DESIGNED FOR USE WITH MIDGET GAS ENGINES

The trend in the size of gas models today is towards a ship of about three to four feet wingspan, and corresponding light weight.

Even novices will find the "Eaglet" easy to assemble. The "Eaglet" won 2nd and 3rd places at recent Philadelphia gas meet, losing first place by only 4 seconds. Flew out of sight in 2 min. 12 sec. on only 25 second motor run.

\$3.95 POSTPAID
Or At Your Dealer's

THIS MODEL HOLDS CHAMPIONSHIP OF FRANCE WITH A FLIGHT OF 1 HOUR 20 MIN.



Seven Red Zephyrs entered at National Contest by Iowa Model Club

NOW ONLY
\$4.95
POSTPAID
(Less Wheels)
With 3 1/2" Pneumatic Rubber Wheels
\$5.95 postpaid

MISS AMERICA Gas Model

**BREAKS
WORLD'S
RECORD!**

NOW HOLDS
WORLD'S RECORD
WITH FLIGHT OF
46 MINUTES WITH
27 SECOND MOTOR
RUN.

Word has just been received from N.A.A. headquarters at Washington confirming this flight made by Mr. Carl Phenix of Galveston, Texas.

Kit is 100% complete.
\$7.50 P.P.

with 3/4" Pneumatic wheels, 7 ft. wing; wt. (less motor) 3 1/2 lbs. 22 min. on one oz. fuel; 15 to 1 Glide.



THE STREAMLINER

Wingspan 6 Ft. Length 43"
Weight (less motor) 2 1/4 lbs.

Correct in aerodynamic design and constructed to withstand hard shocks incident to gas model flight. It is practically crashproof. Has detachable wing, adjustable rudder control, and stamped nose cowl which completely hides engine—with hinged hatch for accessibility.

COMPLETE KIT with Ready-made balsa ribs with notches for spars, Stamped Metal nose cowl with engine hatch, liquids, all balsa cut to correct sizes, nuts, bolts, electrical connections, celluloid, rubber, bamboo paper, large full size detailed plans giving every bit of information needed for building and adjusting the "Streamliner" with instructions for installing any type gas engine.

Complete kit, less wheels, at your dealer or **\$4.85** Postpaid
Complete kit, including a pair of 3/4" pneumatic rubber air wheels, only **\$5.95** Postpaid

This new type Gas Model is remarkably true to Big Plane scale and still retains contest model performance. In test flights it has shown unusual efficiency and proven itself repeatedly. It is absolutely correct in aerodynamic design and constructed to withstand hard shocks incident to gas model flight. It is practically crashproof. Has detachable wing, adjustable rudder control, and stamped nose cowl which completely hides engine—with hinged hatch for accessibility.

SCIENTIFIC'S WORLD-FAMOUS "SCIENCE-CRAFT" GUARANTEED KITS

20" Wingspan with Bridge-Type Landing Gear and Full Size True Scale Drawings

These "Science-Craft" kits offer the best values in authentic scale models of popular ships to be found on the market today. Kits contain everything required to build, including full size detailed drawings and complete instructions. SCIENTIFIC kits are noted for the complete and accurate. Your choice of **50c** Each Postpaid



DEALERS: Write on your letterhead today for wholesale prices on SCIENTIFIC'S FAST-SELLING line of kits and supplies.

SCIENTIFIC MOD A

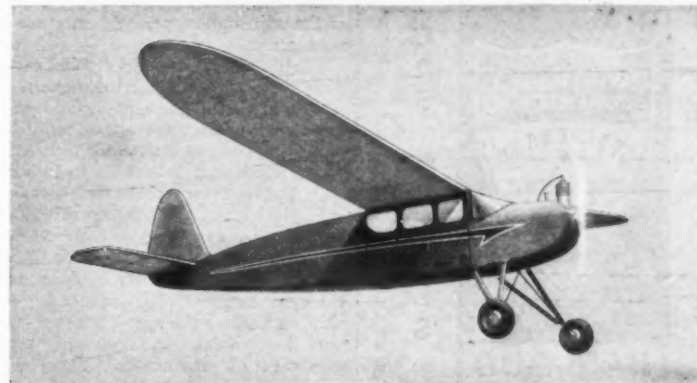
218-220 MA-12 Market Street "GAS MODEL QUAR
In England: Model Supply Store, 37 Broadwood St., Manchester
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WHY BUY A SUBSTITUTE WHEN THE
ORIGINAL, QUALITY AND PERFORMANCE?

All the thrills of gas model flight!
THEY LOOK, FLY, AND SOUND LIKE REAL GAS MODELS

SCIENTIFIC GAS MODEL SUPPLIES

HOOK UP WIRE 5 ft. 20c	TINY TOT-TIMER A high quality light weight timer with the new exclusive scientific silver contact attachment. See it at your dealer or order direct. \$4.95 Postpaid
CHAMPION SPARK PLUGS Each..... 65c	TAIL WHEEL 50c
WRENCH SET 25c	STORAGE BATTERY FOR GAS MODELS Smallest storage battery ever produced. When fully charged will provide power for 30 flights. It can then be recharged to its original voltage and repeat this service. Packed in carton with bottle of distilled water and recharging bulb. Price \$2.50 Postpaid
VALVO-LINE OIL Finest quality SAE-70 for all gas engines. 1/2 oz. bottle with instructions..... 20c	NEEDLE VALVE AND BODY For Brown, Mighty Midget, Ohlsson, Brat, Trojan, McM. Sycro, etc. Meniscus type wanted. Needle Valve..... 50c Body..... 50c
RE-NU MODEL RECHARGE BATTERY For Midget..... \$1.00	1938 MODEL YEAR BOOK—BY ZAIC By Far The Best! 100 pages of priceless data and plans, all drawings of up-to-the-minute models. Every gas model fan should have a copy. Only \$1.00 Postpaid
TAIL WHEELS 1"..... 15c 1 1/2"..... 20c 2"..... 25c	ORDERING INSTRUCTIONS: Add 15c to orders up to \$1.50. Over \$1.50 add 10%. Orders of \$4 or over sent postpaid.
ROBOT TIMER Small size..... \$1.50 my 1 1/2"..... \$2.50 Setting..... \$3.50 Desired..... \$4.50 Time 6..... \$1.50 4000 ac..... \$2.75 Parade and 4100..... \$2.75	With thin head for model airplane construction. A Scientific Guarantee Product. Only 75c.
JACK & PLUG Each piece..... 10c	



MISS AMERICA Gas Type—Rubber Powered Model Airplane

46" Wingspan
Weight 4 1/2 ozs.
Length 27 1/2"
Flies 1 MILE (5280 feet)

This is an exact replica of the full size Miss America gas model. Recently a Miss America gas model flew for 46 minutes on a motor run of only 27 seconds, breaking all world's records for so short a motor run.

This new small Gas Type Model has all the features of the large model. It is a real contest flyer and capable of outlying anything in its class. It takes off from the ground within 4 feet and heads straight up, climbing at an unbelievably high rate without the slightest bit of stalling. Can easily be built by a modeler with little or no past experience. On test flights it passed every qualification of the rigid Scientific standards. Contents of Kit 100% complete, (similar to parts in Firefly and Flea).

\$1.95 including a pair of M & M pneumatic rubber wheels
POST-PAID

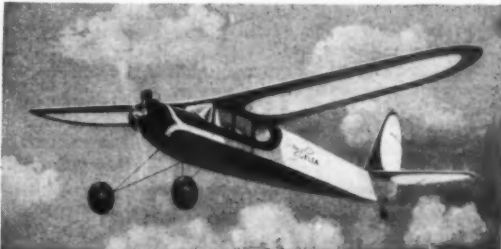
FLIES 1 MILE THE FLEA

(5280 Ft.)
Wing..... 36"
Length..... 28"
Weight..... 4 oz.

This new type of model airplane developed by Scientific will give you all the thrills and excitement of building a real gas job. Thousands of builders have constructed these remarkable models and gotten truly exceptional flights. Build one yourself now and experience the fun you, too, can have with a fine flyer!

The Flea kit is absolutely complete, containing all balsa parts cut to size, dummy gas engine and spark plug, ball bearing washer, motor hum ratchet device, insignia, rubber, metal parts, liquids, full size plans with explicit instructions. Complete, including a pair of M & M wheels.....

\$1.95
Postpaid



Jim Clark's FLEA

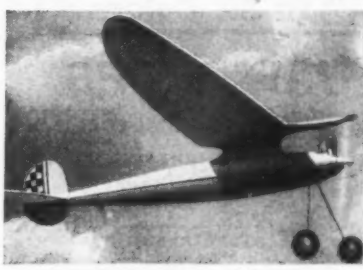
FLIES 10,000 FEET FOR WORLD'S RECORD
Akron, Ohio

Dear Sirs:

My Flea model flew for a distance of 2 miles, or about 10,000 ft. I had launched the model after using a winder and it climbed like an elevator, nosing up steeply but without stalling for a single second.

I thought the model would never come down, but it did eventually and after much running I managed to be on hand when it landed. A perfect flight if there ever was one.

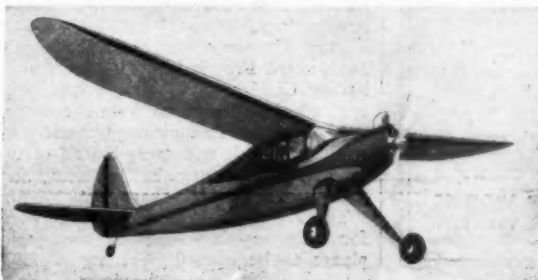
My models from now on will always be Scientific Flyers.



Go To Your Dealer Today!
See Scientific's Famous Prize Winners:
Miss America, The Flea, Valkyrie and Firefly Models.

VALKYRIE
GAS TYPE MODEL
Wingspan 24"
Length 15"
Flies 1/2 mile
Designed by Indow Emert Carl Goldberg in miniature duplicate of his prize winning original which won second place at the "National," Detroit, 1937. Can be easily constructed in 4 or 5 hours. Sturdily built with all latest features.

\$1.00
Postpaid

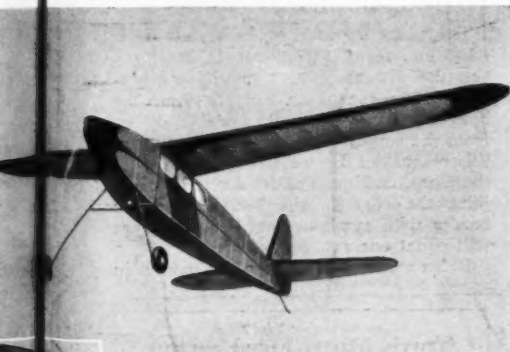


"FIREFLY"

Wing 36". Length 28".
Wt. 4 ozs.
FLIES 1 MILE (5280 Feet)

The "Firefly" is the next best thing to a genuine gas model. It is just the model for those desiring to gain experience before tackling a real gas model. Its advance clean design and beauty will startle you. Think of it—your own gas type model that will soar majestically aloft, steady and graceful as an airliner under expert command! Dummy motor, propeller, full size plans, and a pair of M & M pneumatic rubber wheels.

\$1.95
Postpaid



"ORIOLE" Contest Endurance MODEL AIRPLANE

Flies 2 to 3 Miles

So simple, even the beginner can complete the model in a day. This Model will clear the ground in a short take-off and climb with amazing speed. Every detail of the "Oriole" conforms with N. A. A. contest requirements.

Kit is 100% complete. Black and Orange color motif. All highest quality parts—strip balsa accurately cut to size, ribs, outlines, etc. Clearly printed on sheet balsa, formed wire parts, 15" machine cut drilled balsa propeller, cement, rubber, colored tissue, ball bearing washer, spring steel landing gear wire, pair of streamlined wheels, liquids, full size detailed plane with instructions.

The biggest Kit value in America today!

AIRPLANE CO.
NEWARK, N. J.
In Finland: O-Y Helsinki, Turku, Abo
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Ask Your Dealer For

FOR
HEAVYGAS
MODELS

Colors: Natural, Red, Yellow, Blue and Green—all brilliant

Ref. from Phila.: "We have run tests on Star Brand AMERICAN BAMBOO PAPERS and find them far superior to any that come from Japan. Panels covered with the paper have been tested for resistance to punctures, with falling lead shots. In every case we had to drop the weights twice as far on the AMERICAN paper as on the Japanese. Furthermore, the new paper presents a smoother surface, dopes nicely and does not have objectionable fibers raised above the surface."

JAPANESE TISSUE
Brilliant
THIN AND STRONG
In 32 Colors

JAP PROPS

STANDARD TYPE

BROAD BLADE
50% More Efficient

STEEL TYPE



**MINIATURE
CELLULOID
MOTORS**

4 sizes: 1 1/2"; 2"; 2 1/2"; 3"

Another Japanese
Import

These lightweight motors have been designed to our specifications. Every detail of the original radial engine has been accurately reproduced even to the cowling plate at the front. They are a distinct improvement over any other dummy motor. At Whitfield's low price, they can be easily included in every flying model kit.

We Pay Shipping Charges
WHITFIELD PAPER WORKS
76 VARICK ST. NEW YORK CITY
Established 1889

doors are wide and have a slight curvature which further increases the roominess of the cabin. Pyralin windows are of the adjustable type and permit no-draft ventilation.

The cabin is completely upholstered to give it the appearance of the modern automobile interior. The seats are deeper and more comfortable, and are of molded paratex beautifully upholstered in tufted morocco leatherette in shades to harmonize with the exterior colors, fish-tish.

Flight instruments are centrally located on a broad curving panel which is designed to accommodate additional instruments. The streamlined cowling around the engine adds to the appearance of the ship, as well as the speed, and has proved very successful. It will be standard equipment on all Aeroncas. Specifications of the new Aeronca are as follows:

Wing Span—36 feet; Length—21 feet; Height—6 feet, 7 inches; Empty weight—650 pounds; Gas—12 gallons; Oil—4 quarts; Baggage—40 pounds; Useful load—480 pounds; Gross weight—1,130 pounds; Wing loading—6.68 pounds per square foot; Power loading—22.6 pounds per square foot; High speed—100 miles per hour; Cruising speed—90 miles per hour; Landing gear—32 miles per hour; Rate of climb—550 feet per minute; Gliding angle—1° to 1; Service ceiling—14,000 feet; Cruising range—250 miles.

The Clark Aircraft Company, which is 33-1/3 owned by Fairchild (to complicate matters), has been flying their new Bakelite and wood-molded airplane quite often; and it has been seen at many of the airports in the East. It has gained its A.T.C. The Army Air Corps has been interested in their Duramold process but as yet nothing has materialized.

V-12 Fairchild Ranger engines have been installed on a new twin-engined Koolhoven transport in Holland. The plane has been designed for the Turkish government. The engines are located in the leading edge of the high-winged airplane and are cowled somewhat in the same manner as the V-12 Gipsy engines in the DeHavilland Albatross. But mentioning the Albatross brings up another matter. By this time most of you perhaps have heard of the Second Albatross built and its fuselage cracking in two after landing, which is more or less proof of the uncertainty of wood construction. However, it was not so long ago that the tail fell off of one of our modern all-metal airplanes. The DeHavilland company states that it will have the trouble remedied in short order, so we may see the Albatross over here at a later date. The ship that fell apart had been destined to fly the Atlantic soon and had been going through over-load tests which weakened its structure.

From France comes news that André Japy, noted French long-distance flier, is having Caudron build him a new twin-engined plane for future long speed hops. 220 horsepower Renault engines will power the plane. It will carry a load of fuel for a 4,660 mile range and will only have a wing area of 172 square feet.

The Army Air Corps have advertised for bids on single-engined observation planes to be opened February 23, 1939,

and Vultee may enter a revamped version of their attack-bomber in it. In the past year or two Vultee has delivered attack-bombers to the following: 30 to China at \$970,000; 40 to Turkey at \$3,000,000; 59 to Russia at \$2,000,000; 26 to Brazil at \$1,790,000; 7 to the U.S. Army at \$297,180. Some of the figures given are perhaps planes without engines.

Mr. Berliner of Berliner-Joyce fame and Mr. Fred Weick of nose-wheel fame, are associated with a propeller concern that has the prospects of becoming as well known as Curtiss and Hamilton-Standard. One of their new propellers has a diameter of about seventeen feet and is now under test by the Air Corps!

It is said that several of the new Vought low-wing scout-bombers have been equipped for service test with reversible pitch propellers for use in dive bombing by the navy. The propellers, when reversed, cut acceleration in half to ease the pilot's strain on those terminal velocity pull-outs. Vought has been test-flying a brand new scout-bomber. It is a mid-wing airplane with enclosure running almost the full length of the fuselage. A new type slotted flap developed by the N.A.C.A., which develops a lift coefficient close to the Fowler flap is said to be installed.

There was an error in the September 1938 issue of M.A.N. The photo of Earl Ortman's Kieth Rider racer should have been credited to William T. Larkins of Oakland, California, who contributed it to this article.

How to Build a Model of Col. Roscoe Turner's Thompson Trophy Winning Racer

The plane is easy to build and is a good one for the beginner to start on. Get the dimensions for purchasing material from the plans. Supplies may be bought at your nearest model shop or from the supply companies advertising in this magazine. If you wish to square-off the plans, making it easier for measuring, joint the corresponding dashes on the border with straight lines. Each square will equal one square foot.

Balsa wood is to be used throughout in

Announcing The New Travis Multi-Flex Bearing with Free Wheeling Clutch



One of the smoothest operating and most dependable Free Wheelings ever yet offered, plus—

- 1 Bearing is mounted in universal "Floating Power" support. Is light in weight.
- 2 Completely disengages motor from shaft.
- 3 Is positive. No springs or bulky parts.
- 4 Shaft is rigid on prop. Prop does not spin on shaft.
- 5 Clutch is to rear of bearing.

Travis Multi-Flex Bearing with Free Wheeling Clutch **50c**
T.M.-F.B. without Free Wheeling Clutch **25c**

Prices apply to style for use on motor stick model or nose plug type for fuselage. Specify whether for motor stick or fuselage model.
Dealers write for prices. Our discounts allow you a good margin of profit.

TRAVIS MODEL AIRPLANE CO.
Colorado Springs, Colorado



Registered 7 Horsepower

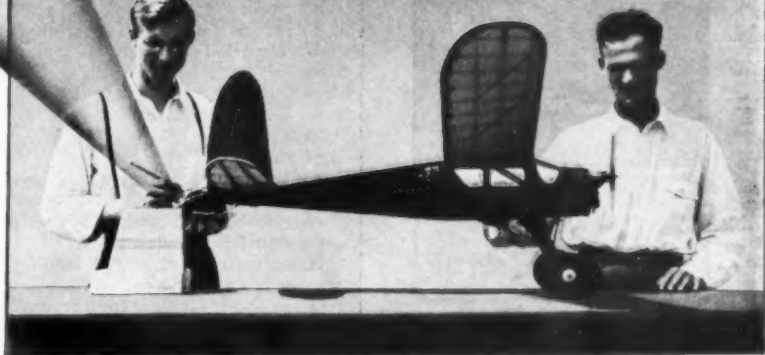
**BUNCH MOTORS
RECORD AMAZING
THRUST ..**

● Here you see a Gwin Aero motor exerting a constant thrust or "pull" measured on a scale at 3 lb. 2 oz. This test actually proves the new power yield and stamina built into Bunch power ported engines.

Bunch Engineers have developed 1/5 h.p. engines smallest in dimensions, lightest in weight and now with an amazing registered horsepower equal to the all up weight of many gas models. Your choice of a Bunch motor with this extra margin of performance and engineered dependability will provide the utmost in gas model contest and pleasure flying.

Each type Bunch motor is an honest accomplishment produced by skill, experience and clever engineering. You profit by owning a Gwin Aero,* Mighty Midget or Mighty Marine engine because their matchless efficiency is not approached by any other engine.

*Gwin Aero engine design embodies a full-length side exhaust integral with cylinder.



POWER PORTING AND PISTON RINGS DISTINGUISH NEW BUNCH MOTORS

All Bunch Engines full 1/5 h.p. at 5200 R.P.M.; 1/4 h.p. at 8500 R.P.M. Bore 3/4". Stroke 13/16". Bare weight 6 1/2 oz. Engines assembled and block-tested, or kits are complete with coil, condenser, fuel tank and Champion spark plug. Engine kits supplied with piston, piston rings and main bearing fitted ready to run. Also timer assembly set up.



<input type="checkbox"/> MIGHTY MIDGET Upright Assembled.....	\$ 9.50
<input type="checkbox"/> MIGHTY MIDGET Upright Kit.....	7.85
<input type="checkbox"/> MIGHTY MIDGET Inverted Assembled.....	9.75
<input type="checkbox"/> MIGHTY MIDGET Inverted Kit.....	7.85
<input type="checkbox"/> GWIN AERO Upright Assembled.....	12.00
<input type="checkbox"/> GWIN AERO Upright Kit.....	9.85
<input type="checkbox"/> GWIN AERO Inverted Assembled.....	12.50
<input type="checkbox"/> GWIN AERO Inverted Kit.....	9.85
<input type="checkbox"/> MIGHTY MARINE Assembled	12.50
<input type="checkbox"/> MIGHTY MARINE Kit	10.85
—Prices Postpaid	

ORDER A BUNCH MOTOR TODAY!

Bunch Model Airplane Co.,
5009 So. Hoover St., Los Angeles, Calif.

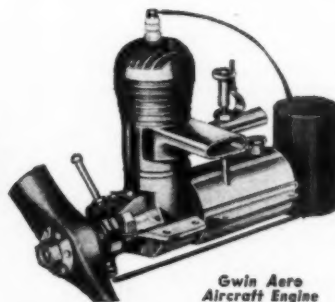
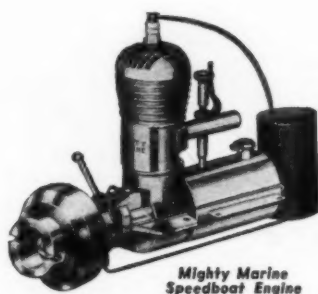
Gentlemen:

I have selected and checked the above motor. Please deliver by return mail. Enclosed is postal money order.

Name.....

Street.....

City..... State.....



BUNCH MODEL AIRPLANE CO.

5013 SOUTH HOOVER STREET, LOS ANGELES, CALIFORNIA, U. S. A.

British Agents: Model Supply Stores, 17 Brazennose St., Manchester

FLY THE AIR CHIEF A RECORD BREAKER

**\$6.00**

Complete without Motor

61" wingspan, length 39"
weight 2 1/4 lbs. without motor

Equip with any standard miniature engine. Kit includes—Wood cut to size, Pneumatic Air Wheels, Formed Shock Absorbing Landing Gear, Die cut Ribs, all needed Parts. Complete without motor \$6.00.

U. S. S. HARTFORD



Historic Beautiful Complete
At last the flagship of Admiral Farragut is yours to build. The kit for this 20" model contains: Balsa hull block, 3 sheets printed wood, cement, lacquer, shellac, piano wire, cast metal anchor, cast metal boats, steering wheel, funnel tubing, dowels, sandpaper, rigging thread, beads, and full size plan. Complete

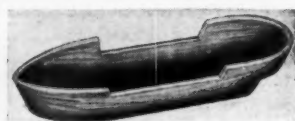
\$1.00

CUTTY SARK

Carved wood hull printed balsa decks. Cast metal: Life-boat, anchor, bits, steering wheel, chains. Masts, spars, rigging cement, colored lacquer, full size plans, instructions. COMPLETE

\$2.50

Complete Catalog 10c DEALERS



SHIP MODELS with MOULDED HULLS

TO RETAIL AT 10c AND 25c



Your name imprinted free on IDEAL'S famous TRU-CUT KNIFE—the only all-purpose tool for model building. It is held and operated the same as a pen. It is especially designed for cutting balsa wood, stencils, paper patterns, and other objects requiring accuracy of detail. At last this greatly-in-demand item may be purchased with YOUR NAME IMPRINTED. Retail 10c each. Write for full particulars.



IDEAL AEROPLANE & SUPPLY CO., Inc.

20-24 West 19th Street, New York
Pacific Coast Branch: 1355 5th Ave., San Diego, Calif.
South Africa Distributor: 70 Von Brandis, Johannesburg, S. A.

making the model. The paint job is silver with black trimmings and only small cans of dope or lacquer will be needed. The wheels or any other accessories may be purchased if desired.

Make the fuselage first. Draw the outline of the top view on a piece of balsa with the grain of the wood running lengthwise. Cut to shape with saw and sharp, flat chisel. Go over the surfaces roughly with coarse sandpaper and then draw on the side elevation. The fin will be put on later. Cut once more and then shape out the contour with your razor blade, as shown by the cross-sections.

Go over the surfaces with coarse and then fine sandpaper until maximum smoothness is obtained; and then begin the wing surfaces. They will be made in two panels, one for each side of the fuselage. Draw the plan view accurately on stock and cut to shape. Then taper them down as shown by airfoil sections and front elevation with a cold chisel and razor blade. Sandpaper the surfaces to smoothness and then make the tail surfaces in a like manner.

The propeller is to be made in four separate parts, namely the three blades and the hub. When they have been whittled out with your razor blade cement the blades to the hub with colorless model cement and lay aside to dry.

It is easier to make the landing gear legs in two separate parts. Shape out the two landing gear legs proper and then the part that extends outward to form the axle on separate pieces of wood. Then connect the two pieces with cement and when connections have dried thoroughly sandpaper to smoothness.

The assembly of the model is simple. Lay the fuselage in flying position and put the wing panels in place with plenty of model cement. Put blocks under the wing to hold it in place. Join the tail surfaces in place next. Take plenty of time and be accurate.

The next step is the landing gear which must be built sturdy. It might be well to use small pieces of wire as dowels. Go over all joints once more with cement and then sandpaper again. Brush off all dust and begin the paint job.

Many coats will have to be applied before a smooth finish is obtained. It might be well to go over the entire model with fine sandpaper after the first coat has dried. After a smooth finish has been obtained and the propeller has been painted silver, connect it to the nose with a straight pin as a prop shaft. Put the wheels on with wire inserted into the landing gear legs as axles. Any trimmings may be added that your skill will allow. You will then have a complete replica of the plane flown by Col. Roscoe Turner to win the 1938 Thompson Trophy Race, setting a new speed record for the event of 283 miles per hour.

What Do You Want to see
in this Magazine, fiction?

The Physics of the Airplane

(Continued from page 27)

The second Newtonian Law expostulates that whenever an acceleration is produced, a force must be applied. This law applies to an airplane engaging in curvilinear flight. We have shown how an airplane when it is flying in a circular path with a uniform airspeed exhibits an acceleration toward the center of the turn. The tendency of an object experiencing circular motion is to fly off in a direction which is tangential to the path of the circular motion. In order to prevent this, a force must be applied which acts at right angles (normal) to the direction of the circular motion. This force is the equivalent of the acceleration of the second Newtonian law. The force which holds the airplane on this circular path and which acts in toward the center of the turn is known as the "centripetal" force. The full magnitude of the centripetal force is equal to:

$$F = \frac{W \times A}{G}$$

F: Centripetal force

W: Weight

A: Acceleration

The acceleration in the case of a uniform circular motion is equal to:

$$4 \times (3.1416)^2 \times \text{Radius} \times (\text{R.P.S.})^2 \times \text{Wgt.}$$

32.2

The answer to this equation is the force that must be continuously exerted to keep the airplane moving in a circular path. Since this force must also have a reaction, the reaction is known as "centrifugal" force. The centrifugal force and the centripetal force are equal in magnitude but opposite in direction. See Figure 2. This shows the forces acting upon the airplane during a steep banked turn.

Periodic motions may be useful and yet dangerous in aeronautics. A simple example of periodic motion can be expressed by the degree of dihedral rigged into the wings of the high-winged monoplane. The disposition of the low center of gravity and a high center of lift make for stability on the lateral axis. If the wing is displaced, the center of gravity is also displaced.

(Continued on page 44)

FLASH! BURROWS WINS

2nd Annual Southeastern N A A Gas Model Contest



Wing span 5 1/2', Chord 12", Flying weight 3 1/2 lbs.
Burrows Special flown by G. A. Burrows, took first place in the Southeastern Contest, held at Charlotte, N.C., Sept. 11, 1938.
Official time 2 minutes and 17 seconds, on a 50 second engine run.
G. A. Burrows took second place in this contest in the fuel allowance event, with the same Burrows Special.
Official time 4 minutes and 17 seconds on a gas allowance of 4/16 ounce.
Burrows Special Kit complete (less motor, timer or air wheels).....\$5.50
Burrows Special Kit (less motor) with timer and 4 1/2" air wheels.....7.50
Prices F.O.B. Charlotte, N.C.
We also handle all other popular makes of kits at advertised prices.

CHARLOTTE MODEL AIRCRAFT CO.
Professional Bldg. (Basement) Charlotte, N.C.

WORLD'S RECORD
30-second shut-off
Houston, Texas

TRENTON PETROLEERS MEET, Mercer Airport
Harold Johnson won R.J. Hughes Trophy... setting
new official N.A.A. Record of 6 Minutes 25 $\frac{1}{2}$ seconds

EASTERN STATES MEET
1st - 2nd - 3rd - 4th and 5th
places to Brown Model D

11th ANNUAL NAT'L. CHAMPIONSHIP
MODEL AIRPLANE MEET, Detroit
All major events won by Brown Motors

SOUTHERN CALIFORNIA GAS MODEL
MEET... 1st - 5th - 6th and 8th places

NEW YORK GAS MEET
1st and 2nd places

6th ANNUAL MISSISSIPPI VALLEY MEET
Winner of Performance event



Count these contest records ... and see why the Brown Motor is the only one for your model!

Noted above are just a few of the contest records recently made by Brown Junior Motors. Brown has so many victories to its credit that you can't fail to place it No. 1 on your wanted list. And—you can now buy this famous motor for less than the price of an ordinary motor kit! Get this incomparable power-plant for your model. Get set for your own contest records—and for more thrills than you've ever known before! Junior Motors authorized dealers, equipped to give you expert service and advice, are located in every section of the country.

MAKE YOUR MOTOR RUN BETTER WITH THIS NEW SPARK PLUG



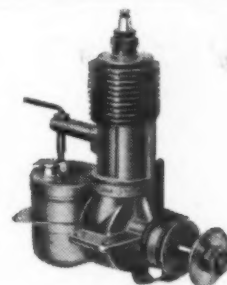
Engineered specially for model motors. High-tension dielectric heat resisting core. Special thermo-controlled center electrode. Concentrated, powerful spark for easy starting. Leak-proof for perfect performance and long life. Make your model motor run better. Change to the J-M Spark Plug today. 65c each.

Other Brown Junior Motors include these outstanding performers:

MODEL B: Special steel cylinder and steel piston retain compression and power. Chrome-molybdenum crank-shaft, practically shock-proof. \$21.50 complete. **MODEL C:** Light weight combined with durability at the medium price of \$17.00 complete. **MODEL M (MARINE):** With the speed and stamina characteristic of Brown motors for model planes. \$15.00 complete.



JUNIOR MOTORS CORPORATION
2545 N. BROAD STREET, PHILADELPHIA, PA.



BROWN JUNIOR MOTOR

MODEL D

complete with coil and condenser—ready to fly—only

\$10

MODEL D SPECIFICATIONS

Bore, $\frac{3}{8}$ " Stroke, 1". Weight (bare) $6\frac{1}{2}$ oz. $\frac{1}{2}$ h.p. R.P.M. 1200 to 10,000. Height $4\frac{3}{4}$ " (including spark plug). "Z" metal counterbalanced crank-shaft. Connecting rod of forged aluminum alloy.

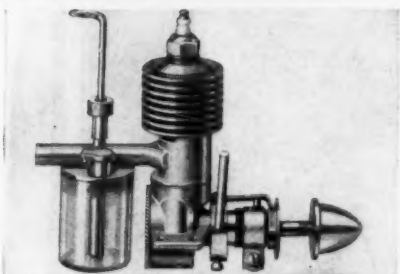
Block-tested before shipping and guaranteed against defective workmanship or materials.

Brown JUNIOR MOTORS

SCIENTIFIC Is Headquarters for

All Nationally Advertised Motors

BRAT THE ORIGINAL LIGHT CLASS MOTOR



The POWER PLANT for Champions

THE 1939 MODEL BRAT is the most complete motor of its size. All parts are precision finished to .001" and are completely interchangeable. THE BRAT is TOPS for appearance, performance, power and dependability and is one of the easiest motors to start. With Such Features as transparent and unbreakable gas tank, strong aluminum crank case, foolproof and adjustable spark system, etc., the Brat is one of the lightest weight motors for its size on the market. Specifications: Bore . . . 9/16" Stroke . . . 1/2". Overall height . . . 4 1/2". Weight . . . 3 1/2 oz. Flying weight . . . 8 oz. (including batteries). Speed . . . 3500 to 7500. Shipped complete with coil, condenser, plug, correct design propeller, instruction manual and can of S.A.E. 70 oil.

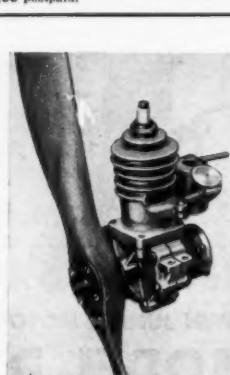
PRICE \$16.50 POSTPAID

DO NOT be confused by motors with similar sounding names, remember the original light class motor is spelled

B-R-A-T

BRAT MOTOR KIT—all parts precision made. Easy to assemble in one hour. This makes an ideal combination when used with the Eaglet gas model. Complete kit for motor and airplane only \$16.00 postpaid.

\$12.50 P.P.



THE ELF AIRCRAFT ENGINE

A Gasoline Engine For Small Model Airplanes. Guaranteed Performance

The ELF starts easily and quickly under all conditions on two fountain pen flashlight cells. (Booster batteries are never used.)

The ELF runs more than 45 minutes on one ounce of fuel with the standard propeller turning at 3500 rpm. A three ounce bottle holds enough fuel for a day's flying.

Runs smoothly and steadily without misfiring, sputtering, or speed fluctuation at all speeds. Speed is controlled by advancing and retarding the spark, making it possible to test-fly models safely by slowing the engine.

If your engine fails in any of these four points it will be repaired or replaced free of charge.

The ELF is further guaranteed against defective material or workmanship. Any such faults will be repaired free of charge.

CONSTRUCTION DETAILS

The cylinder and crankcase are sand cast of aluminum, the cylinder fitted with a thin steel liner.

The timer is automobile type, completely enclosed, with contact metal points, hardened cam and cam plate. The spark plug weighs 1/10 ounce and has a 1/32 thread.

INVERTING—The ELF does not flood or foul its plug in the inverted position. ELF model weighs from 12 to 20 ounces including the complete power plant. Wing span of 3 to 5 feet.

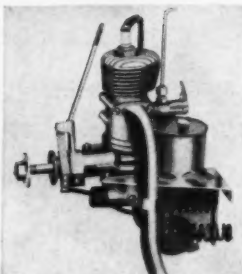
Bore 0.545 inches
Stroke 1/32 inches
Displacement 0.138 cubic inches

Vt. of bare engine 4 oz.
Complete with batteries, fuel, propeller, etc. 8 oz.

Engine sold complete, including coil, condenser, fuel tank, propeller and may be had in either upright or inverted position. Postpaid.

\$21.50

1939 AIRSTREAM DENNYMITE



3/4" bore — light weight — 500 to 1200 R.P.M.

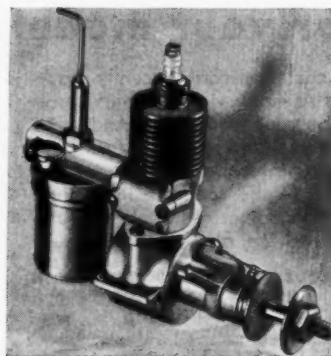
DELUXE Standard on the DeLuxe Airstream are aluminum outside exhaust, dual mounts, superior coil, and outside-control choke. \$17.85

STANDARD Includes hot-spark coil and condenser. Does not include DeLuxe mounts, brackets, spring choke, down-draft exhaust. \$15.85

UNIT (Less coil and condenser) This economy purchase is identical to the higher priced standard model except that condenser and coil are not included. \$13.85

SPECIAL BUY

DENNYMITE powerplant: standard round cylinder head engine at this new low price. Tremendously powerful, over-size bearings, many deluxe features. Packed complete, ready to fly, with dual mounts. Factory tested, adjusted, guaranteed. \$14.50 anted and postpaid.



NEW PEE-WEE 1939 SMALL BORE MOTOR

An Amazing New Midget Motor

- Lightweight
- Compact Size
- Speed
- Power
- Easy Starting
- Dependable

SPECIFICATIONS

Bore: 3/8". Stroke: 9/16". Height: Over-all 3 1/4". Length: Over-all 4". Speed: 500-10,000 R.P.M. 3500 R.P.M. Runs 8 to 12 minutes on 1/4-ounce of fuel. Cylinder: Cast iron, with 11 fins for efficient cooling at all speeds. Piston lapped and machined to .0001". Crankshaft: Machined from tool steel. Main Bearing: Oilite Oil Cushion, bronze. Connecting Rod: Special durable alloy, die cast. Wrist Pin: Steel. Carburetor: Die cast aluminum. Needle type mixing valve. Spark Plug: Champion 1/4"-32 SAE thread. Battery: Operates with 2 Penlite batteries. Timer: Fully adjustable for accurate speed control. Tungsten points. Operation: Operates upright or inverted.

\$14.50 Postpaid

Assembled, Tested, Guaranteed (Includes Coil and Condenser and Prop.)

FREE WITH PURCHASE OF ANY MOTOR, INSTRUCTION MANUAL ON CARE AND OPERATION OF YOUR MOTOR; ALSO SCIENTIFIC'S IRONCLAD DOUBLE GUARANTEE ON EVERY MOTOR PURCHASED. COIL AND CONDENSER ARE ALSO INCLUDED (WITH EXCEPTION OF DENNYMITE UNIT).

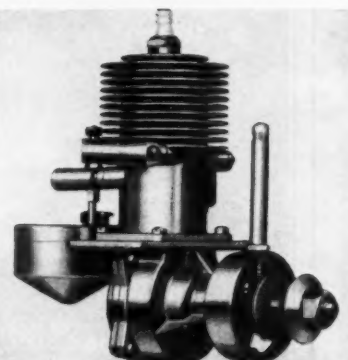
SCIENTIFIC MODEL AIRPLANE COMPANY

216-226 MA-12 Market Street

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In England: Model Supply Stores, 4 Stewart St., Deansgate, Manchester
In Australia: Swift Model Aircraft, 188 Adelaide St., Brisbane, Queensland
In Finland: O.Y. Wiklund & A/S, Turku, Abo

Newark, N. J.



FORSTER "HERCULES" THE MOTOR OF CHAMPIONS

To come out on top, to win contests, you must look for good design, dependability, and general quality in the motor of your choice. Bore 1 1/16", stroke 1 1/8", 1/2 H.P., 2 pls. rings, bare weight 14 ounces.

OUTSTANDING FEATURES OF THIS MODERN MOTOR Ball Bearing Crankshaft, Automotive Type Timer, Most Efficient Spark Coil, Improved Carburetor, New "Low Head" Gas Tank, Most Powerful Motor Per Unit of Weight, Lightest Motor Per Horsepower, Equipped With Two Piston Rings, Light Weight Alloy Piston, Lynite Connecting Rod, Renewable Bearings.

It is well to bear in mind that the power of the FORSTER motor "B" is 1/2 H.P. at 5,000 R.P.M. It will swing a 16", 18", or 20" propeller. The bare weight of the motor is 14 ounces. The flying weight, complete with coil, condenser, tank and battery, 21 ounces. This is a lesser flying weight per H.P. than smaller motors. Accordingly, a plane powered with a FORSTER motor will weigh between 4 and 5 ounces above that of smaller motors which, when pro-rated over a wing area of 7 to 11 square feet, amounts to about 1/2 ounce per square foot. The FORSTER motor is truly a LITTLE HERCULES.

All motors are assembled, tested, and run at the factory. Model "B" Air cooled, complete with spark coil and condenser \$17.75

Model "C" Air or Water Cooled, Complete with Coil, Condenser, Spark Plug, and Gas Tank, Not including Flywheel, with Bronze Bearing. \$19.50

The Same with Ball Bearing. \$17.75

Finished and balanced Flywheel, 3 1/4" Dia. especially for FORSTER BROTHERS Motors. \$19.50

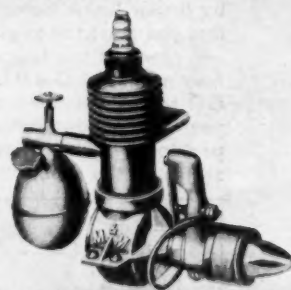
M & M's NEW 1939 MODEL

HIGH-POWERED SMALL BORE MOTOR
for POWER, STAMINA and
LONG ENDURING PERFORMANCE

M & M Products Are Built for Quality, Performance and Not to Meet Competitive Prices

SPECIFICATIONS
Bore 21/32". Stroke 22/32". Weight of Bare Motor 3 1/4 ounces. Total Weight, Motor, Coil, Gas 7 1/4 ounces. Ready to Run—Left Prop. Speed Range 500 to 12,000 R.P.M. With M & M Special Designed Prop. STATIC THRUST, 20 OUNCES. CYLINDER AND PISTON—Machined from solid stock of special cast iron to .0001 inch. IGNITION—Pool-proof set of points with a SPECIAL DEVELOPED M & M breaker arrangement. COIL—Special M & M 2-4 volt spark coil. Designed to operate on two pen-cells. These coils are OIL-PROOF, WATER-PROOF, and SHOCK-PROOF. MOTOR OPERATION—All M & M motors operate upright or inverted. All motors are assembled and block tested at the factory before shipment. All M & M motors are sold only as completely assembled units.

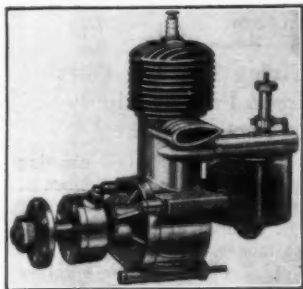
\$17.50 POSTPAID



SCIENTIFIC

Always Stocks 1000 Motors
For Immediate Delivery

OHLSSON Model "23" SMALL BORE ENGINE



A rugged baby brother of the famous Ohlsson Gold Seal Motor—only 3-9/16" high, but packed with more power, speed, and stamina than any other motor for its size on the market. The Ohlsson "23" has plenty of power to fly a 3 lb. model, yet it is small enough to fly a 20 oz. job—in other words it's the perfect "3/4" for every small ship. Like its big brother, the Ohlsson "23" is built from the finest materials money can buy, and is assembled and tested under the rigid supervision of the same men who have made Ohlsson motors first choice with model fans the world over.

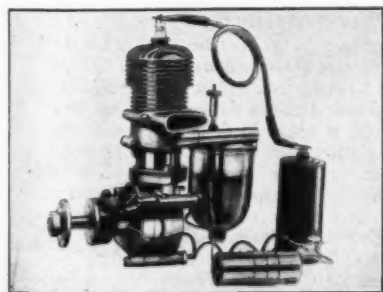
Compare the Ohlsson "23" part by part with any other motor of comparable size on the market—and we'll let you be the judge!

SPECIFICATIONS

Horse power 1/7; Stroke 3/4"; Bore 5/8"; Bare engine weight only 4 1/2 ounces; Height 3-9/16"; Mounting—combination radial or lug, Dural 1-beam connecting rod. Bronze Bearings. Carburetor—special needle type mixing valve. Crankshaft—1/4" machined from solid stock. Timer—fully enclosed, adjustable. Switch ignition coil. Spark plug—Champion 1/4" x 32". Gas tank—special clear transparent composition. The fact that all parts are completely interchangeable makes replacement easy and economical. Ohlsson motors operate upright or inverted. Order your Ohlsson "23" engine now for immediate delivery. Complete with coil, condenser, etc.

Pretested and
Fully Guaranteed
\$16.50

POSTPAID
Scientific Double
Guarantee.

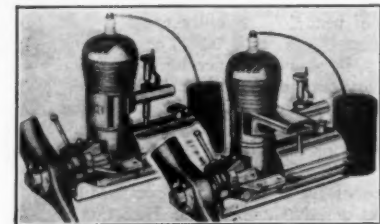


OHLSSON GOLD SEAL MOTOR

H.P. 1/2. Bore 1 1/8". Stroke 15/16". 500 to 10,000 R.P.M. Bare Wt. 8 ozs.

Ohlsson Gold Seal miniature motors are built to give that extra margin of performance between an ordinary motor and a champion! The combination of the finest raw materials and the most skilled engineering in the industry produces in Ohlsson Miniature Motors a degree of performance that is seldom equalled and never exceeded. Every Ohlsson Motor is a Champion from the first turn of the prop—that's why model builders everywhere enthusiastically endorse Ohlsson. Order yours today! Complete, including Coil, Condenser, Oil and Double Guarantee.

Only **\$18.50** POSTPAID



New BUNCH "39" MOTORS

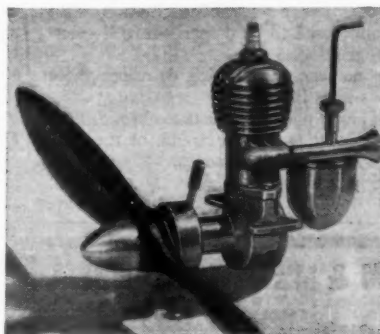
Climaxing months of intensive experimental work, BUNCH engineers announce they have packed still more power into the distinctly new Model "39" Gwin-Aero, Mighty-Midget and Mighty Marine engines. The Model "39" engines are not "revised downward" and cheapened to promote sales. The new engines are offered at a price made possible only by more efficient, highly developed production methods.

The Model Motors With Modern Aircraft Features CHECK THESE EXCLUSIVE FEATURES

One-piece modern Aircraft Cylinder:
Micro-Metal Machine Cast Crankcase:
Pressure Lubrication through Hollow Drilled Crankshaft:
New Reversible "Marcel Locking" Timer System:
Micrometer Type, Spring-Locked Needle Valve:
"Square Section" Piston Rings and Hi-Dome Piston:
Specifications: All Bunch Engines full 1/2" h.p. 5200 r.p.m.; 1/4" h.p. 8500 r.p.m. Bore 7/8", Stroke 13/16", Bare Weight 6 1/2 oz. Complete, ready to run, with coil, condenser, fuel tank and Champion spark plug.

MIGHTY-MIDGET Upright Assembled.....	\$9.50
MIGHTY-MIDGET Upright Kit.....	7.85
MIGHTY-MIDGET Inverted Assembled.....	9.75
MIGHTY-MIDGET Inverted Kit.....	7.85
GWIN-AERO Upright Assembled.....	12.00
GWIN-AERO Upright Kit.....	9.95
GWIN-AERO Inverted Assembled.....	12.50
GWIN-AERO Inverted Kit.....	9.95
MIGHTY MARINE Assembled.....	12.50
MIGHTY MARINE Kit.....	10.85

ALL prices are postpaid
FREE correct design propeller, S.A.E. 70 oil, and instruction manual and Scientific Double Guarantee.



BANTAM MINIATURE MOTOR

The BANTAM motor is the result of years of painstaking research. A watchful eye has been kept upon achieving maximum horsepower per ounce and rugged construction which will insure long life. The Bantam engine boasts many advanced structural features:

- Heat treated alloy crankcase
- One-piece chrome vanadium steel crankshaft
- Chrome molybdenum cylinder liner
- Heat shaped piston rings
- Nickel aluminum alloy piston
- Efficient cooling
- Efficient carburation

SPECIFICATIONS

Bore 19/32". Stroke 19/32". Bare engine weight 2 1/2 oz. Speed range—500 to 10,000 R.P.M. Gas tank removable for cleaning. Capacity 1/2 oz. Semi-enclosed and adjustable timer. Spark Plug—1/4" x 32 V-12 Champion.

PRICE **\$16.50** POSTPAID

FREE correct design propeller, S.A.E. 70 oil, instruction manual and Scientific Double Guarantee.

THE NEW SYNCRO ACE

The new SYNCRO ACE—the popular priced streamlined miniature gasoline engine for model airplanes and boats, is equipped with new high efficiency coil, oilite bearings, and the new specially designed CHAMPION Spark Plug.

GENERAL SPECIFICATIONS

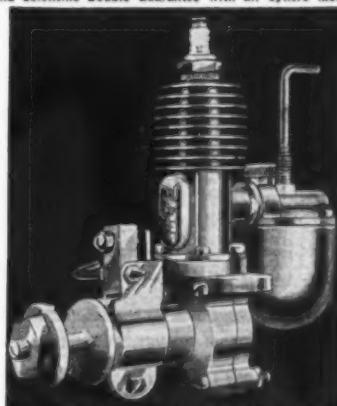
Horsepower—approximately 1/2. Bore—5/8". Stroke—15/16". Motor Speed—800 to 8,000 R.P.M. Cylinder—Machined steel to within .0001". Piston—Special matched steel alloy. Connecting Rod—Cast of Special aluminum alloy. Crankshaft—Counterbalanced, machined from special accuracy stock. Timer—Improved steel and fiber construction placed conveniently above oil and grime interference. Ignition Coil—Light weight, high efficiency, developed by Delco-Remy Corporation. Spark Plugs—New Champion, Standard 1/4".

PARTS ALL INTERCHANGEABLE, except piston and cylinder which are machined and lapped together.

EVERY ENGINE FACTORY TESTED, MOUNTED ON SKIDS AND SOLD READY TO RUN, complete with coil, condenser, fuel tank, etc.

PRICE **\$13.75** POSTPAID

FREE, correct design propeller, S.A.E. 70 oil, instruction manual and Scientific Double Guarantee with all Syncro Motors.



THE NEW SYNCRO BEE

The new SYNCRO BEE—the smallest practical model gasoline engine ever put into production—the ideal power plant for those tiny new planes. Design has been so planned that the advantages of quantity production methods enable us to pass along this saving to you. Equipped with the new Syncro light-weight specially designed high efficiency coil, Oilite bearings, new Champion V-2 Spark Plug.

GENERAL SPECIFICATIONS:

Horsepower—Approximately 1/4. Engine Weight complete—3 1/4 oz. Bore—1/2". Stroke—5/8". Motor Speed—1000 to 8000 R.P.M. Cylinder—Special machined steel. Piston—Special Aluminum Alloy with 2 rings. Connecting Rod—Cast of special aluminum alloy. Crankshaft—Precision machined from specially treated steel stock. Timer—Steel and fiber construction placed conveniently above oil and grime interference, as used on the famous Syncro Ace. Ignition Coil—Syncro's new "SUPER-LITE"—weight 1 1/4 oz., specially developed for the SYNCRO BEE. Spark Plug—New Champion V-2 1/4".

VERTICAL OR INVERTED. PARTS ALL INTERCHANGEABLE. EVERY ENGINE FACTORY TESTED

PRICE **\$12.50** POSTPAID

NEW HUSKY MOTOR
FOR 1939
5/8" bore 5/8" stroke, wt. ready to run 8 1/2 ozs. Each motor is thoroughly tested, run in, and carries the famous Scientific Double Guarantee. Complete with coil, condenser, propeller, and can of SAE 70 oil. Order from Scientific today.

\$12.50
POSTPAID

SCIENTIFIC MODEL AIRPLANE COMPANY

218-220 MA-12 Market Street

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In Australia: Swift Model Aircraft, 188 Adelaide St., Brisbane, Queensland
In Finland: O/Y Wiklund A/B, Turku, Abo

Newark, N. J.



The Gas Model Bargain of the Year!

CLEVELAND CLOUDSTER

**Sensational in Design—Value—
and Performance**

The hit kit of 1938-1939—with its flashy all-red speedline design and "high climb"—just the thing that is needed for contests these days. While designed for motors of $\frac{1}{8}$ and $\frac{3}{8}$ size—still better climb for contest work. From the word "go," it's a complete C-D creation (following no particular prototype) and directly in line with Cleveland's ever practical consideration, the nose has been made wide enough to easily accommodate all known engines. The whole power unit, meaning the engine bearers with batteries, coil, motor, etc., may be made to remove from the fuselage in one unit for test or repair.

Climbs and glides beautifully, is very simple to build and has an extremely realistic look that so conspicuously marks C-D models. You'll be proud to call it yours. Don't delay ordering your Cloudster today. If your dealer hasn't it in stock, we'll rush yours to you postfree.

(Dry kits mean
no cements or
dopes included)

THE KIT:

Includes adjustable wings and stabilizer; name plate for the fin, with space for your name and address in case the model is lost, incorporated right within the design. Span of 50", length 31". Kit contains all necessary balsa, everything needed printed out, with full size C-D drawings, celluloid, leading edge, music wire, nuts, bolts, washers, etc., absolutely everything except the cements, dopes, wheels and power unit with propeller.

If you want us to include all dopes, cements, and M & M gas model wheels with your order, add \$1.75 to the \$5.00 price and of course if a motor is desired, send for this right with the kit. All standard makes in stock at regularly advertised prices.

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Complete Dry Kit SF-45 (span 53 1/4"), \$4.85
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CURTISS HAWK P-6-E FIGHTERS
Complete Dry Kit SF-21 (span 23 3/4"), \$2.25
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BUD WARREN SAYS:

"Your chances in gas model competition depend most upon your motor. Snapped at 10 second intervals at a recent contest these pictures show why:"



1. "Your number is up!" The timer is ready. Powered with a Tom Thumb the motor sings with a single flip of the prop. The efficient 1 1/2 H. P. Tom Thumb cowl into a small space, permits streamlined ship design.

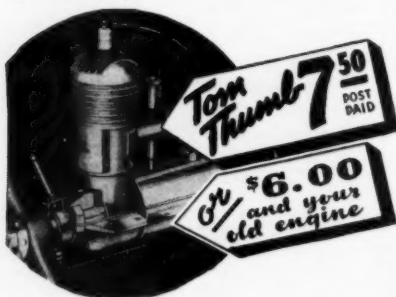
2. The official start! Humming at fast two cycle speed the Tom Thumb does not falter at this critical instant. Rocketing skyward the Tom Thumb on limited motor time reaches highest altitude for a winning flight.



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SPECIFICATIONS and HOW to BUY the NEW TOM THUMB

The Tom Thumb is the most powerful easy starting 1 1/2 H.P. engine made. Clip the coupon below, enclose money order for \$7.50 (also your old motor for special \$6.00 offer), and receive a brand new assembled and block tested Tom Thumb. Complete with fuel tank, coil, Champion spark plug, one piece cylinder and head and other modern features. Complete flying weight 10 oz. (less batteries). Bore 7/8"; Stroke 13/16".



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- ☐ Rush me one New Tom Thumb Engine. I enclose \$7.50.
☐ Rush me one new Tom Thumb Engine. I enclose \$6.00 and my old engine (any make) including all parts regardless of condition.

I intend to run my Tom Thumb—

☐ Upright ☐ Inverted

Street.....

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City..... State.....

for the title of this article. Letters from all over the world have been received from model builders who have written about the performance of their ships. The first KG in the Rocky Mountain area was built by Harry Cornish and Robert Van Buskirk of Denver; while from far-off Australia, Mr. Ivor Freshman wrote that the KG was the first gas model to take the air in that section of the world. Other letters from Belgium, England, France, Finland and even South Africa tell of the fine performances of these ships.

What transport flyer wouldn't like to have the combined flying time to his credit of all the KG's that have been built. And speaking of statistics, if all the miles flown by these same KG's were in one straight line it would reach from *Here to There* and back again several times. A salute to a great ship!

The Amiot 341 Long Range Bombers

(Continued from page 11)

The structure is composed of two vertical oleo struts attached on each side of the main wheel axles, and with a definite forward set. Two rearwardly inclined articulated struts are attached near the wheel axles and at the bottom of the engine nacelles. Two small electric motors are attached at this latter connection in each gear at the point of articulation. This strut folds forward, hinging half its length, by the rotation of the electric motor and raises the main gear backwards and rearwards up into the tail of the engine nacelles. Retraction is abnormally swift and may be halted at any point and held rigid for an emergency landing should an engine failure accompany a hurried take-off.

Power is supplied by two Hispano-Suiza 14 Ha fourteen-cylinder radial, air-cooled engines developing 1,100 horsepower at 12,500 feet. These are mounted high in the wing, close inboard, and are supported by steel-alloy struts from the main wing spar, to which the landing gear struts are also attached.

Latest models of the Amiot 341 have been powered by the new Gnome-Rhone 18 Lars, 18 cylinder, double-row, radials developing 1,300 horsepower at 16,500 feet. This latter is definitely a high-altitude engine and performance in the higher stratas has been vastly improved. The propellers are Hispano-Suiza three-bladed, all-steel controllable pitch type.

Tankage consists of four main fuel wing tanks of 165 gallons each, or a total fuel capacity of 660 gallons. An oil tank of 45 gallons is located in each wing nacelle just to the rear of the engine. With this tremendous fuel load, the Amiot has a cruising range of 1,240 miles, twice that of standard types.

The crew is made up of a pilot and chief officer who is located high and forward of the main wing in a completely glassed-in steel hatch compartment situated slightly to the port side of the nose. Behind him in the same hatch is the radio officer and co-pilot. He is equipped with complete Marconi wireless and a special French Air Ministry method of ultra-short wave communication as yet undisclosed. This latter uses neither voice nor code and is accom-

plished by means of instantaneous frequency changes.

In the long, tapered, glassed-in nose is the forward gunner. He is armed with the new DeSautier 22 millimeter non-recoil aerial cannon developed by the French Air Force. This is fired through a sliding glass slit in the revolving nose turret in which the gunner is strapped. Behind him is the bombardier officer who handles the sighting and release of bombs. A bomb load of one ton is carried, a potent array of high-explosive strength.

The Amiot 341 has a wing span of 82 feet and is 49 feet, 2 inches long. The wing area is 538 square feet and it is 11 feet, 6 inches high. The structure, empty, weighs 8,800 pounds. Crew and equipment weigh 1,100 pounds; fuel and oil tankage, 4,400 pounds, and its useful load of 3,300 pounds augment to a gross weight of 17,600 pounds ready for flight.

Performance figures recently released after exhaustive tests by the French Air Force credit the Amiot 341 with a maximum speed of 295 miles per hour; faster than the speediest time recorded in the 1938 National Air Races by tiny, high-powered racing planes! Its cruising speed at 13,120 feet is 264 miles per hour. And here's an astounding fact: the Amiot has an absolute ceiling of 32,800 feet; more than six miles!

The ship is now going into extensive squadron service with the French Air Force and something like 600 are said to be on order. Such a harbinger of havoc might serve well as a peace measure in these troubled times. And the Amiot is more than a threat of destruction; it is a promise!

Build the Ship On the Cover

Select a straw-colored block of even-grained balsa about 6 x 1-3/4 x 1-3/4 inches and trace the side view outline on it.

Cut down with a band- or small hand-saw and trace the top view outline on. Cut this down to size and shape into circular section with a sharp knife or razor blade, taking extreme care excessive gouges are not made. Cut out cross section templates and apply to fuselage at points indicated

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\$9.75

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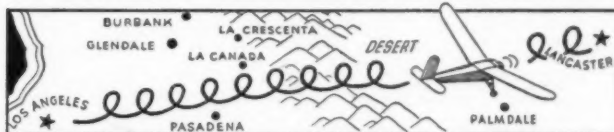
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NON STOP; COVERS 55
MILES; REACHES 11,500 FEET**

★ ★ *The Most Remarkable
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Performance in Model History!*

BILL ATWOOD DOES IT AGAIN!

Checked by an official Western Union timer and observed by two following airplanes and two automobiles, a new stock 1939 Bill Atwood 5/8" Phantom Engine mounted in the 4 lb. 90" special Phantom plane and carrying 16 oz. of gas, broke three world's records in a sustained flight of 2 hours 46 minutes 43 seconds on October 1, 1938. This is the greatest 3-way record ever established by a miniature engine, bettering the previous record by 45 minutes, and is your guarantee that the Phantom will give you the greatest performance you can buy at any price.

Taking off from Burdett Airport, Los Angeles, the Phantom Engine pulled the plane to a checked height of 11,500 feet, and in wide circles worked its way to the north above the treacherous San Gabriel mountains. Over Lancaster, California, 55 miles



distant, the second of the observing planes was forced down for refuelling and at that point the Phantom was still in the air — no one knows how much longer it remained aloft. A reward has been offered for its discovery.

This is Bill Atwood's latest — and greatest — record. Atwood designed engines have won a staggering list of events, including two California State championships and the world's records for Class C boats with a speed of 39.24 m.p.h.

You will never be satisfied with less spectacular performance than the Atwood Phantom gives you. Insist on a Phantom and break your own world's records. Order today — shipment guaranteed within 24 hours.

SPECIFICATIONS: Only engine made with Dowmetal crank case; 1 7th H.P. at 6500 r.p.m. (actually develops nearly 1 6 H.P.); runs upright or inverted; bare weight 3 1/2 ounces; flying weight with 2 pen light cells 7 1/2 ounces; hardened steel timing cam; new quick starting carburetor; oversize bronze bearings; entire engine may be taken apart with screw driver.



BILL GAGE, observer and A. E. MATHEWS, timer, congratulate BILL ATWOOD, right.

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UNION**

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Please rush prepaid to me the items I have checked below:

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18" Balsa	PNEUMATIC AIR WHEELS
1/16x1/16 100, 5c	3 1/2" - Dair 1.50
1/16x1/8 35 for 5c	SPRING STEEL WIRE
1/16x3/16 18, 5c	1/16 dia. 5 ft. .12
1/16x1/2 15 for 5c	3/32 dia. 5 ft. .25
3/32x3/32 30, 5c	1/2 dia. 5 ft. .15
3/16x1/2 30 for 5c	3/4 dia. 5 ft. .22
1/2x1/2 12 for 5c	DURALUMIN
3/16x3/16 8, 5c	1/2" x 1/2" per ft. .15
3/8x3/8 6 for 5c	3/4" x 1/2" per ft. .22
1/2x1/2 3 for 5c	MOTOR FUEL
3/8x3/8 3 for 5c	Paint .30
1/2x1/2 4 for 10c	STREAMLINED ALUM. TUBING
1/32x2 8 for 10c	1/2" x 1/2" per ft. .15
1/16x2 8 for 10c	3/4" x 1/2" per ft. .22
3/32x3 7 for 10c	SPARK COILS
1/2x2 6 for 10c	0 Sec. to 1M. 2.00
3/16x2 3 for 10c	DURALUMIN
1/2x2 3 for 10c	1/2" x 1/2" per ft. .15
3/8x2 3 for 10c	3/4" x 1/2" per ft. .22
1/2x2 1 for 2c	FLIGHT TIMER
5" sheets or 36" lengths, double above prices; add 10c for pkg. chge.	30 Sec. .50
18" PLANKS	0 Sec. to 1M. 2.00
1x1 5c; 1/2x2 6c	DURALUMIN
1x1 1/2 9c; 1x2 10c	1/2" x 1/2" per ft. .15
1x3 15c; 2x2 18c	3/4" x 1/2" per ft. .22
2x3 23c; 2x4 28c	TUBING
3x3 40c; 3x8 75c	1/2" x 1/2" per ft. .15
SHEETS 12"x2"	3/4" x 1/2" per ft. .22
1/16 or 1/32	
10 for 10c	
8 for 10c	
3 for 7c	
3/32 8 for 10c	
3/16 3 for 7c	
1/2 each 8c	
BAMBOO	
1/16 sq. 12, 5c	
1/16x1/8x15, 10c	
CLEAR DOPE OR THINNER	
5c per oz.; Large bottle, 8c; 1/2 pt. 30c; 1 pt. 45c	
COLOR DOPE	
5c per oz.; Large bottle, 10c	
CLEARCMENT	
5c per oz.; Large bottle, 8c; 1/2 pt. 35c; 1 pt. 55c	
PROPELLERS	
Balsa Paul-O-Mach. Cut Wina	
5" 4c	
6" 5c	
7" 6c	
8" 7c	
9" 8c	
10" 8c	
12" 10c	
14" 10c	
15" 15c	
RUBBER	
.045" .25 ft. 5c	
1/16 sq., 15 ft. 5c	
1/2 flat .15 ft. 5c	
Skeln .50c	
3/16" .10 ft. 5c	
RUBBER LUBRICANT	
Large bottle, 10c	
BAMBOO PAPER	
White .2 for 5c	
Red or yellow 10c ea.	

20 IN. FLYING PLANS 10c—3 for 25c
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Balsa Paul-O-Mach. Cut Wina

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BAMBOO PAPER

White .2 for 5c

Red or yellow 10c ea.

WOND. WATER SPRAYER 15c

WHEELS per pr.

Brah Bala Gelu

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WHEELS per pr.

Brah Bala Gelu

WOND. WATER SPRAYER 15c

WHEELS per pr.

Brah Bala Gelu

plane covered. The transparent nose section may also be built up of a strong, wire mesh, cellophane covered. Purchase wheels, size 3/8 x 5/32 inch, or next largest size available. Build up the landing gear struts of strong bamboo lengths or wire. The propellers are carved from three lengths of balsa, glued and sanded. Paint the fuselage silver and wings and tail surfaces blue. Draw rivet lines in india ink and paint in engine detail in front of engine cowling and your model will be complete.

Aviation's Dare-Devil Scientists

(Continued from page 9)

Don Rae, who no longer flies in competition due to his airline employment, features a hydraulically retracting landing gear, trailing edge flaps, and hydraulic brakes. It was built by the Story-Gawley Company, famous propeller designers, and looked every inch a winner. But these dare-devil scientists also have to have flying ability!

Fourth Place went to Earl Ortman, who was flagged down after sixteen laps in his Rider-Bromberg "Jackrabbit," a re-designed Rider creation powered by a Menasco C6S4 of 300 horsepower.

George Dory, at the helm of the silver Bushey-McGrew "Bumblebee," experienced motor trouble and swooped into a landing in a Fairview street five miles from the airport. Unluckily he chose a dead-end one for his emergency landing and crashed through a row of trees at the end of it. His ship was demolished and he taken to a hospital—all because of unsolved problems on the supercharged motor. But he's solving those problems right now. And he'll have the answer by the next time aviation's dare-devil scientists convene!

Harry Crosby, handsome Pasadena, is probably America's premier racing engineer, although the results he has so far obtained might not justify the title. But aerodynamics is a life work with him and he hopes to some day prove that his racers are the fastest, most dependable and most highly developed in the nation. His CR-4 is an all-metal low-wing monoplane of radical design. The ship has a cantilever tapered wing of 16 feet span and is 21 feet, 6 inches long. Its weight of 1940 pounds is much heavier than comparative planes of fabric and tubing construction. Its skin radiators and exhaust manifold are unique in racing circles. Aerodynamically it is far in advance of any racing ship now in existence and he has a bale of technical reports from the wind tunnel staff of the California Institute of Technology, Guggenheim Aeronautical Foundation, to prove it. His ship, or rather a large-scale model of it, has spent many hours in the testing laboratory. Test and change has been Crosby's routine for the past year and he's done it with the dogged determination that only an unsatiable interest in aviation development could sustain. But engine trouble has always dogged him. Twice he has made forced landings, damaging his ship badly and putting himself in the hospital, once for six months. This year he was forced to drop out of the Greve Trophy Race after fourteen laps and he didn't get away in the Thompson Trophy Dash until the entire

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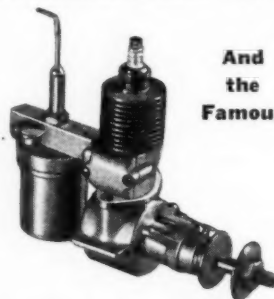
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THE PEE-WEE SPEEDSTER

Here is a plane that can't be beat for flying stability. Sturdy and strong. Designed especially for the famous PEE-WEE motor. Wing Span 54". Chord 6". Length over-all 28 1/2". Weight ready to fly approx. 24 oz.

Kit contains full size three view plan, printed ribs and body formers, selected Balsa strips, Basswood for motor mount, hookup wire, bamboo paper, 1 pint of dope, cement, wire for landing gear, airwheels, and 10" propeller. KIT COMPLETE, only..... **\$375** (Plus 50c postage)



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PEE-WEE MOTOR

The sensational little motor that has been setting a fast pace for performance and sales during the past six months. Built in Detroit, the Motor City.

Height 3 1/2", length 4", weight, including coil and battery, approx. 8 oz. Bore 1/8", Stroke 9/16". Oilite oil cushioned bronze main bearing. Tool steel crankshaft. 3500 RPM with 10" prop.

Motor Assembled, Tested and Guaranteed \$1450 Postpaid

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DALLAIRE MODEL AIRCRAFT CO.,
9830 Wyoming, Dept. N12, Detroit, Mich.

field had circled the course. But he's met his fellow flying experimenters and he's discussed that engine trouble with those who have solved the problem. And he has given them a few pointers on design. An exchange of ideas has thus resulted in two designers going back to work with more knowledge and better ability to advance their own experiments.

The Thompson Trophy Race, premier speed classic of the world, found Roscoe Turner nosing across the finish line and garnering \$22,000 in cash prize money. Unsolved problems have forced him out for two years running but this time he came back with a winning wallop and proved his personal contribution to aerodynamics: a single-strut fixed landing gear can be designed so efficiently that its drag is far overshadowed by its saving in weight over bulky retracting mechanism. Traveling three hundred miles per hour at some points,

and sand to shape. The wings are carved from balsa blocks of about 4-3/4 x 1-3/4 x 3/16 inches. They are very heavily tapered and wing section templates should be followed closely. Apply ambroid to the fuselage at points shown in the plans and drive two dowels into the fuselage and into each wing panel. Glue them thoroughly and a good, rigid structure should result. Tail surfaces are cut from sheet balsa and glued on at right angles. The pilot's cockpit may be built up of a solid balsa block, suitably painted, or a small wire framework, cello-

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6 FOOT WINGSPAN
For 1/6 to 1/4 h. p.

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This plane will outclimb anything with equal power. You have to see it perform to appreciate it.

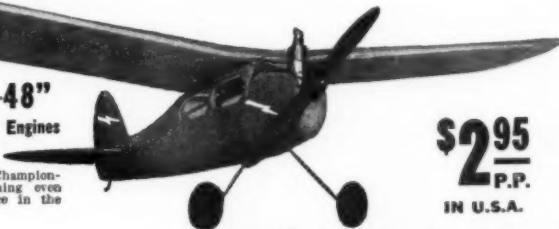
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Turner averaged 283.419 miles per hour for the three hundred mile distance. His ship, a mid-wing, fabric covered, steel tubing design, was originally built by Lawrence Brown, later revamped by Matty Laird, and recently reconstructed by Turner and associates. Power is supplied by the giant P&W Twin Wasp Senior developing 1500 horsepower.

Earl Ortman, flying his yellow and black Marcoux-Bromberg, limped in for second place with motor trouble. Ortman has flown this ship since 1934 and each year has found refinements and changes until this year he qualified for the Thompson with a speed of nearly three hundred miles per hour. The ship was originally a Keith Rider product which overturned during a take-off and killed Jim Grainger of Santa Monica, California. The prop clearance was too small and changes were made. The small P&W Wasp Junior of four hundred horsepower has been supplanted each year



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by larger and more powerful motors until now the ship carries a 1500 horsepower Twin Wasp. And here's a story few know: both Hal Marcoux and Jack Bromberg are designing engineers with Douglas Aircraft Company. Big-time scientific designers turning to air racing for real advancement via experimentation.

S. J. Wittman, lanky Oshkosh, Wisconsin, flying school operator, probably has more unique ideas about what an airplane should look and act like than any of these scientific dare-devils. His ships have all resembled barn doors and box-kite contraptions with no semblance of speed or performance in their appearance. But in the air Wittman's ships give teeth to his ideas and he's a consistent money winner; money that goes for more experiments. This year he was blasted through the air by the pull of a giant Curtiss D-12, liquid-cooled military engine and supported by 14 feet of wood and fabric wing span. His "Bonzo"

has received many months of painful attention on its engine's cooling system and his nose-spinner fan arrangement has at last met with success, for this year he takes home \$4,500 with which to continue his work.

The racing fraternity lost one of its newest members in the crash of Russel Chamber's "Chambermaid." During qualifying speed trials for the Greve Trophy Dash, Chambers was the victim of a bad landing which annihilated his high-wing racing creation and gave him head injuries from which he later succumbed. His tiny plane, easily the smallest at the Show, was powered with the only Menasco B4S four cylinder motor at the meet. Of welded steel tubing construction, the "Chambermaid" featured a spring leaf retracting landing gear, drawing vertically into the fuselage, and a cantilever tapered wood wing. The ship was 17 feet, 3 inches long and had a span of only 13 feet, 8 inches. It weighed 1,075 pounds and had a top speed of two hundred miles per hour.

Marion McKeen, Angeleno flying teacher, improved his venerable crimson "Miss Los Angeles" with the addition of a cantilever wing and retractable landing gear but failed to start in either race, due to motor difficulties.

Clarence MacArthur, who set a record mark of 207.027 miles per hour in a timed trial in New Orleans in his "Delgado Flash," Menasco C6S4 powered monoplane, failed to attain qualification figures, due to the bulkily faired fixed landing gear. The ship was constructed by students at the New Orleans Delgado Trades School and is of welded steel tubing, wood winged design.

"Mister Smoothie," a Pearson-Williams-Clark project, failed to show, due to engine trouble. Power was supplied with the giant Curtiss "Conqueror" military liquid-cooled "V-12" model and streamlining was beautifully done. The plane was very large, however, having a 24 foot wing span, a length of 26 feet and weighing 3,080 pounds.

Acrobatics, smoke-writing, parachute jumping, army and navy squadron flying and various contests and awards served to thrill the three hundred thousand spectators and round out the racing program. But the sweet taste of victory and the knowledge that their ideas, born on drafting tables, developed in darkened workshops, and proved on triangular race courses was thrill enough for aviation's dare-devil scientists. Effervescent with new ideas gathered from round table discussions, racing performances, and screaming ships, this handful of defiant progress searchers jingled prize money in their worn pockets and departed for their backyard laboratories.

Another year is ahead of them before they again meet; a year of fantastic dreams, painstakingly practical applications, and thorough testing. Then in 1939 another conclave of hard-headed aviation scientists, another test of practicality, and another chance to prove themselves right. And another chance to say, "I've DONE something . . . for aviation!"

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NOSE BLOCKS 1x2x1 1c 2x2x1 3c 2x2x1 3c 3x2x1 4c 3x2x2 7c 3x2x3 9c 3x2x3 9c 3x2x3 9c	PROP. BLOCKS 1/2x1/2 7-5c 1/2x1/2 6-5c 1/2x1/2 3-5c 1/2x1/2 2-5c 1x1 1/2x12 3c ea. 1x1 1/2x12 5c ea. 1x1 1/2x12 6c ea.	ALUM. WHEELS 1" pr. 6c 1 1/2" pr. 11c 2" pr. 15c Sheet Aluminum One oz. bottle 10c 2 sheets 10c 12x16 15c	REED 1/32 or 1/16" 1/4 in. 3 ft. 1c 1/2 in. 3 ft. 2c	5 FOOT 5 Balsa 1/2x1/2 30 20c 3/16x1/2 12 20c 1/2x1/2 10 20c 3/16x1/2 8 20c 1/2x1/2 6 20c 3/16x1/2 3 20c 1/2x1/2 1 8c 1/2x1/2 1 10c	WIRE .014 6 ft. 2c .020 .028 6 ft. 3c .034 .040 6 ft. 6c 1/16" 3 ft. 5c 1/8" 5 ft. 25c
18" BALSA 1/16x1/16 100 5c 1/16x1/16 35 for 5c 1/16x1/16 18 5c 1/16x1/16 15 for 5c 3/32x3/32 30 5c 1/2x1/2 30 for 5c 1/2x1/2 12 for 5c 1/2x1/2 10 for 5c 3/16x1/16 8 5c 1/2x1/2 6 for 5c 1/2x1/2 3 for 5c	WHEELS per pr. Bresh Bala Celo 1/2 .01 .03 1/2 .02 .04 .05 1/2 .03 .05 .07 1/2 .04 .07 .10 1/2 .06 .09 .16 2 1/2 .12 3 1/2 .30	TISSUE, AA All col. doz. 10c Silver ea. 5c Superfine, wh. 5c CAMEL'S HAIR BRUSHES Small 3c; med. 5c Large 8c BAMBOO PAPER 2 for 15c Wood Veneer	MICROFILM One oz. bottle 10c Sheet Celluloid 2x2-5c 6x-10c 12x16 15c	Specific whether hard or soft. Add 25c pack. charge on 5 ft. lengths.	NOSE PLUGS 1/2" 1 doz. 5c 3/8" 1 doz. 10c
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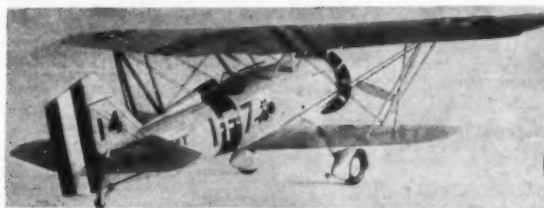
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The most exclusive and finest equipped model in the world. A special de luxe model, one of the most beautiful ever made. Set contains a 4 1/2" scale Wright Cyclone celluloid motor, detailed push rods, fins, etc., like real motor, 4 1/2" aluminum cowling, 10" steel type carved prop shown, 2 1/4" wheels, tail wheel, star and rudder insignia and lettering, rubber windshield, instrument board, flying wires, 4 aluminum step plates, aluminum wing walks, ready cut wheel pants, wire, washers, 3 oz. grey paint, 1/2 oz. yellow, 1/2 oz. red, 2 oz. blue, etc. All other parts are printed on balsa wood. 33"x11" scale drawing. This model has movable controls from the cockpit. Const. set, complete in \$4.50 labeled box, postpaid.



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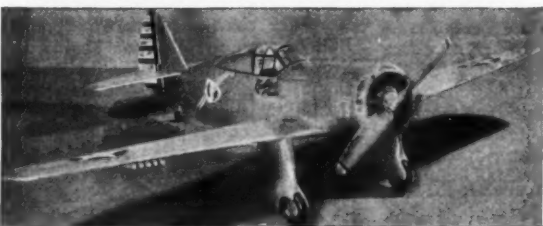


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Plans approved authentic by Lockheed Aircraft Corp. This is a De Luxe model with special equipment. Set includes two 2" celluloid motors, aluminum motor fronts, two 2" aluminum cowls, two 4" three-bladed aluminum props, two 1 1/2" M & M pneumatic air wheels, all parts printed on balsa, set of colored paints, glue, etc. This is the finest transport model made. Set, postpaid. \$4.50

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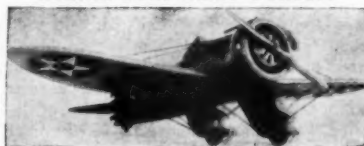
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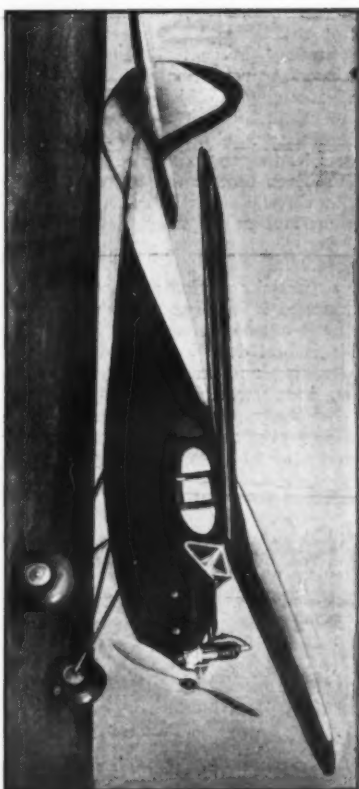


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STOCK ANCHORS White metal 1/8"..... 5c 3/16"..... 5c 1/4"..... 5c 3/8"..... 5c 1/2"..... 5c 3/4"..... 5c 1"..... 5c 1 1/4"..... 5c 1 1/2"..... 5c 1 3/4"..... 5c 2"..... 5c 2 1/4"..... 5c 2 1/2"..... 5c 2 3/4"..... 5c 3"..... 5c 3 1/4"..... 5c 3 1/2"..... 5c 3 3/4"..... 5c 4"..... 5c 4 1/4"..... 5c 4 1/2"..... 5c 4 3/4"..... 5c 5"..... 5c 5 1/4"..... 5c 5 1/2"..... 5c 5 3/4"..... 5c 6"..... 5c 6 1/4"..... 5c 6 1/2"..... 5c 6 3/4"..... 5c 7"..... 5c 7 1/4"..... 5c 7 1/2"..... 5c 7 3/4"..... 5c 8"..... 5c 8 1/4"..... 5c 8 1/2"..... 5c 8 3/4"..... 5c 9"..... 5c 9 1/4"..... 5c 9 1/2"..... 5c 9 3/4"..... 5c 10"..... 5c 10 1/4"..... 5c 10 1/2"..... 5c 10 3/4"..... 5c 11"..... 5c 11 1/4"..... 5c 11 1/2"..... 5c 11 3/4"..... 5c 12"..... 5c 12 1/4"..... 5c 12 1/2"..... 5c 12 3/4"..... 5c 13"..... 5c 13 1/4"..... 5c 13 1/2"..... 5c 13 3/4"..... 5c 14"..... 5c 14 1/4"..... 5c 14 1/2"..... 5c 14 3/4"..... 5c 15"..... 5c 15 1/4"..... 5c 15 1/2"..... 5c 15 3/4"..... 5c 16"..... 5c 16 1/4"..... 5c 16 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JUST OUT THE THERMAL-MAGNETT 6 FOOT GAS MODEL



Weight 20 ozs. with engine

Complete Standard Kit (Without Air-wheels)	\$2.50 P.P.

Deluxe Kit with Airwheels, Silk for cover	\$3.50 P.P.

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Full Size plans and Instruction.....

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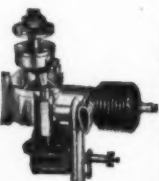
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The OHLSSON "23"
1/7 Horsepower

This engine makes a perfect combination with our "Mike" Kit.



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 As illustrated, plus four
 sizes of vacuum pumps,
 exhaust, and carburetors
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 KIT ONLY
 Legs, coil and end-vent
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BOYS: This is just the gas model you want. It has everything you can wish for including many of the up to date features. Its flying qualities can not be beat by any other model.

Wing Span 72" Length 48" Weight 3 Lbs. with engine

Kit includes: full size plans, printed sheets, balsa, ready cut ribs, carved prop to suit your engine, larce cans of cement, dope, and colored dopes, bamboo paper and plenty of strips to complete the model.

\$4.95 Deluxe Kit with 4 1/2" airmotors and silk for covering.....**\$7.50**

Complete Kit (without airmotors).....**\$4.95**

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P.P.

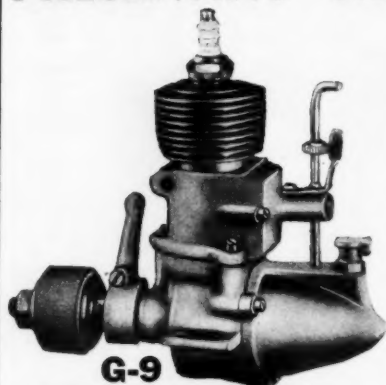
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RUBBER POWERED SUPPLIES—Low In Cost But High In Quality

Deluxe Kit with 4 1/2" airwheels and silk for covering.....

\$750 p.p.

PRESENTING THE "G-9" MOTOR



G-9

NEW-STRONG-POWERFUL

SEND 10c FOR COMPLETE CATALOG FOR HOBBYISTS
This motor will be on sale in N. Y. City at R. H. Macy & Co., Bloomingdale Bros., and Patterson Bros., and at all Imp. Dealers throughout the world.

UNEQUIVOCALLY GUARANTEED
MECHANICAL PERFECTION

After exhaustive tests under the roughest and toughest conditions WE NOW ANNOUNCE a superlatively hardy Model Airplane and Boat Motor. This is not an engine that has been torn down to a price. It HAS BEEN BUILT UP TO A NEW HEIGHT IN VALUE. EMBODYING FEATURES not found in motors twice its price with half its endurance, G-9 bids fair to dominate the Model Motor field.

NEW PORT DESIGN insures instant start, economical operation.
TWIN EXHAUST TO EACH SIDE OF FUSELAGE.
STREAMLINED GAS TANK integral with crankcase.
FOUR MINUTE GAS CAPACITY.
CYLINDER AND PISTON LAPPED TO .0002" TOLERANCE.

EXTRA LARGE MAIN BEARINGS OF TORIN BRONZE.

SELF ADJUSTING TIMER POINTS.

POSITIVE ADJUSTING NEEDLE VALVE easily removed for cleaning.

CYLINDER CADMIUM PLATED.

SHOCK PROOF EXTRA STRONG CRANKCASE, practically unbreakable.

THREE SCREW ASSEMBLY: takes only a jiffy to mount, or break down for adjustment or cleaning.

WEIGHT BARE-9 1/4 oz. with gas tank 13 1/2 oz. with 7" stroke-15 1/2" H.P.-4 1/2 plus

COMPLETE with Champion Spark Plug, Coil and Condenser and all wiring, mounted on test block. TRIPLE TESTED before shipment to you. Accompanied by full instructions. No C.O.D. shipments unless accompanied by deposit.

U. S. Only

\$10.00 R.P.M.-From 300 to 7000 with 13" prop. Up to 10,000 with flywheel

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Light enough for the smallest gas model yet strong enough to be used by aero transport lines. Shrinks perfectly, can be doped with many coats, clear or colored, without fear of shattering. A perfect covering that does not have to be handled with "kid gloves."

Use PERVEL on your next job. We GUARANTEE SATISFACTION UNDER ALL CONDITIONS.

THREE 24x36" SHEETS
SENT POSTPAID - 25c

Build and Fly This Cloud Chaser

(Continued from page 13)

wing and stabilizer. Stabilizer's leading and trailing edges and center piece are 1/16 x 3/16-inch balsa strips. Tip pieces are same size but are set on edge to give greater gluing surface for the twin rudders. Diagonal stabilizer bracings are 1/8 x 1/16-inch balsa strips.

Bevel the two pieces which form the stab's leading edge, then pin these and the trailing edge down on your drawing and cut bracing to fit, making joints as indicated on drawing. Precoat all joints with thinned cement, using normally thick glue for final assembly. When cement dries, stabilizer is turned over and covered with white tissue. Grain of paper should run from leading to trailing edge, not lengthwise. Even though the covering is not to be shrunk, sun will tighten up tissue and surface might warp were grain of covering tissue to run parallel to trailing edge.

If this is your initial covering attempt, don't be discouraged if it seems difficult. Keep trying until a smooth covering is attained. This is best done by applying thin dope to leading and trailing edges and end ribs, then stretching slightly larger piece of tissue over stabilizer frame and pulling taut with finger tips. Remember—don't shrink tissue with

water or try to dope the paper.

Twin rudders are cut from 1/20-inch thick sheet balsa. Edges of rudders are sanded round, then glued, one to each end of the stabilizer, after precoating cementing surfaces. Be certain rudders are parallel.

When complete, entire tail unit is glued on motor-stick with the covered side of the stabilizer on top. The stabilizer rests flat on stick at no degrees of incidence and is off-set slightly, as shown, to make model circle to the left. This is known as circling the model with torque.

Wing spars are 1/8 x 3/16-inch strips. Pin them down on the full size panel drawing. Ribs are cut from 1/16-inch sheet balsa by using a metal or cardboard template. Using this template pattern, cut sixteen ribs each 1/8-inch deep. Leaving out the two center ribs, fit remaining ones into place between leading and trailing edges by cutting off rear portions until all are in place. Precoat cementing surfaces, then glue ribs in position. This method of tapering the wing by cutting a bit more off the rear of each rib while working outwards from the center eliminates stalling wing tips, thus adding to the efficiency of the main lifting surface.

Wing tips may be bent from 1/16-inch square bamboo or reed. Dihedral is obtained by raising one wing tip 6-1/2-

inches off working board when other wing panel is flat on board. First precoat the surfaces which will touch, then glue the two panels together. Cement the two center ribs together and glue in place. After drying, again coat joints with glue.

While the wing is drying, bend the two wing clips from No. 14 wire to the exact shape shown on the plans. After wing panels are glued together, precoat wing spars where clips will be attached, then cement clips to wing. Bind clips to spars with fine thread and coat with glue. Clips should fit motor stick snugly, but not so tightly that wood is cut deeply by wire.

Using white tissue cover the top of the wing, one panel at a time, with the grain of the paper running parallel to ribs. A good wing-covering method is to start with a piece of paper slightly larger than the panel which it is to cover. With dope as an adhesive, attach paper to center rib. Then work slowly outwards towards the tip, a few inches at a time, applying dope to leading and trailing edges with a small artist's brush, smoothing out the tissue with the finger tips.

The landing gear which protects the propeller as well as permitting R.O.G. take-offs, is also bent from No. 14 wire. Wheels are 1-1/8-inch circles cut from 1/8-inch thick sheet balsa. Cut two circles for each wheel and after precoating glue together with grain of wood running opposite, as shown. Washers are glued to both sides of each wheel, then wheels are slipped on wire landing gear and ends of wire bent up. See illustration.

Instead of cementing landing gear to motor stick, thin rubber wrapped around the wire and stick holds landing gear in place. This permits gear to be quickly removed for hand-launched trials.

Final phase of construction is one of the most important. It has been wisely worded: a propeller can make or break a model. The prop for this cloud chaser is carved from a balsa block 1-3/4 x 1 x 12-inches in the four steps illustrated, or a 12-inch, machine-cut, partially-com-

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TRADE MARK

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JASCO'S first international recognition was its introduction of specialized indoor products. It opened the indoor field to all model builders by making available at all times the lightest balsa in all three grades. JASCO'S supremacy in the indoor field has never been questioned, nor its quality ever equaled. Manufacturing indoor balsa and minute metal parts requires precision work and practical model flying experience. Also, the profit motive must be secondary since indoor balsa and supplies must pass at least four production inspections. The above paragraphs are for you youngsters. Old timers know that JASCO stands for the best possible supplies for indoor models. Wherever indoor models are built and flown you'll find the above trade mark on the Flying Ghosts.

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- Because JASCO prices are normal. The popularity of its supplies can best be gauged by the 400% increase in production in less than one year. Find out why Chicago in every field, indoor, outdoor, gas and gliders, recommend JASCO products. Send a postal for your copy of our 1938 Catalogue and Handbook.

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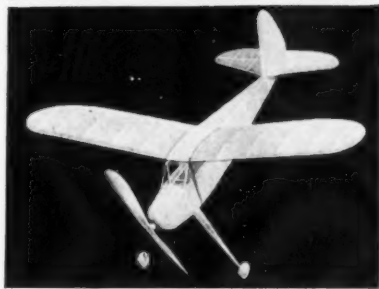
**TO THE WINNER OF THE 1939 NATIONALS
PROVIDING HE IS FLYING A MODEL CRAFT GAS JOB**

Be a winner! Buy a Modelcraft Kit and get in the Champion class. Start right now—send for our FREE Catalog of latest Gas and Rubber Models and Supplies.

★ A Modelcraft gas job won the Dupont Trophy for first place at the 1937 Nationals.

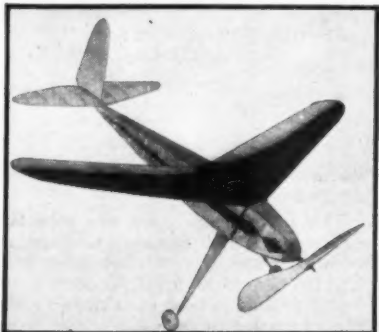
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30 in. PACIFIC ACE

A practical and durable commercial model. Easily constructed from well drawn and detailed plans. Kit contains an ample supply of first grade wood and high quality cement. Comparable with and out-flies most dollar kits. Add 10c for Postage. **25c**



RECORD WRECKER

Newest Modelcraft Sensation! With a 24" span the Record Wrecker includes freewheeling unit, rubber lube, contest rubber, best quality balsa, cement, dope, and large full size plans. Add 10c for postage. **50c**



1939 PACIFIC ACE GAS MODEL

New throughout, with latest improvements in design and construction. Flying weight 3 lbs., 4 oz. Wing span 46 in., tapered from 12 to 5 1/2 in. Kit contains formed landing gear, formed aluminum (Orwick) cowl, die-cut ribs, inflatable air wheels, hook-up wire, cement, dope, complete. **\$8.50**
Dry kit same as above without cement, dope, silk or wheels **\$4.75**



1938 SCOUT GAS MODEL

A Ship for POWERFUL flying, with a 60" tapered Clark Y wing. Kit contains formed landing gear, ready-cut ribs, formed face plate and cowl, switch, hook up wire, cement, dope, silk, full sized plans and Voit air wheels. Only **\$7.25**

Prepaid in U.S.A.

Special money saving deal: Kit, Timer and Ohlsson engine. **\$25.00 SAVE \$2.25**

Same kit with bamboo paper and rubber Donut wheels **\$4.85**

Dry Kit: No cement, dope, covering or wheels **\$3.95**

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POWER WITH BRAT, TROJAN, HUSKY, ELF OR CHUNN ENGINE. Boys, here is the plane for you. Easy to build, and flies smooth as a Gull. 38" tapered wing. Kit complete with cement, dope, wheels, covering, printed ribs, formers, etc. **\$1.50**

Deluxe kit with Traxler air wheels and silk covering **\$2.95**



NEW FLIGHT TIMER

Adjustable from 1 second to 1 hour. Weight 5/8 oz. Accurate, reliable. Complete to drilled mounting holes. Ready to attach wires and install in ship. The first dependable timer made just for models... **\$1.25**

SOGARD PROPELLERS



9", 12", 13", 13 1/2", 14"

Same high-quality Sogard Propeller with true pitch, accurate balance, maximum thrust and minimum torque. **49c**

Take Advantage of This Sensational Offer. Order Today!

BROWN MOTORS



We carry a complete stock of Brown Motors and Parts.

Model "D" \$10.00 Post Paid

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GOLD SEAL

For that extra margin of performance.

SPECIFICATIONS

Horsepower 1/2. Bore 7/8". Stroke 1 1/2".

500 to 10,000 r.p.m.

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MODEL "23"

Check-full of power, speed and stamina!

SPECIFICATIONS

Horsepower 1 1/2. Bore 1 1/8". Stroke 2 1/4".

Bare weight 4 1/2 lbs. Height 5 5/16".

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BRAT



TROJAN JR.



Original light class motor. The Power Plant for Champions.

SPECIFICATIONS

Bore 9/16". Stroke 5/8".

Bare weight 3 1/2 lbs. Overall height 3 1/4".

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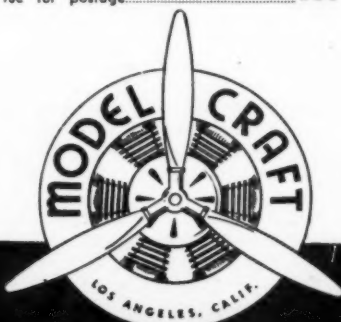
The only motor using Roller-Bearings.

SPECIFICATIONS

Bore 5/8". Stroke 5/8".

Light Weight. Overall height 3 1/2".

.....\$16.50 Post Paid



MODEL CRAFT

7306 SOUTH VERMONT AVENUE, LOS ANGELES, CALIF. ★ THE LEADING SUPPLY HOUSE OF THE WEST ★

EASY TO ASSEMBLE—EASY TO OPERATE—HIGHEST VALUE—\$5.00No oil,
Gas, Batteries
or Propeller
included**ONE DAY
DELIVERY**

Over 7000 of these same, famous G.H.Q. gasoline engines have been sold at \$8.50 during the past year alone. Mass production methods and enthusiastic reception have enabled us to reduce the price from \$35 originally to the **NEW LOW PRICE** of \$5.

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THE G.H.Q. GAS ENGINE KIT IS ABSOLUTELY COMPLETE!! ALL MACHINING DONE—ALL YOU NEED IS A SCREWDRIVER!!

G. H. Q. KIT OFFERS MANY SPECIAL FEATURES

1. New High Compression Piston and Cylinder
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3. WINSTON spark coil
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1938 Sales of G. H. Q. Engine Kits Are at the rate of 10,000 A YEAR

AN ENGINEERING TRIUMPH AT A RECORD LOW PRICE

Indeed an engineering triumph based on years of exhaustive scientific aerodynamic research. The G.H.Q. motor has broken records for amazing performance... flies model planes up to 10 foot wingspread... just as efficient for boats, etc. Easy to start and simple to operate.

HOW TO ORDER: WE SHIP EXPRESS COLLECT C.O.D. FOR BALANCE

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G.H.Q. MOTORS, INC.**854M East 149 Street****NEW YORK, N.Y.**

pleted prop may be finished off and used. It is quite possible that some builders might make use of both types of propellers and compare performances.

In either case, the prop shaft is bent to shape shown from the same size wire as the other fittings. The shaft is cemented in place and several flat washers or a single ball-bearing washer is placed between the propeller and thrust bearing.

For trial flights your cloud chaser may be powered with eight strands (four loops) of 1/8-inch flat rubber which has but little slack. After adding rubber, adjust the wing on the motor stick until a smooth glide is evident—then move the wing clips back about 1/16-inch and hand-wind the motor to a double row of knots.

With this power the model has been found to rise-off-ground or climb from the hand and turn in creditable flights. If model stalls in flight move wing back slightly; if take-off is slow try moving wing forward.

Should the eight strands of rubber prove insufficient to send the ship skyward in a suitable climb, add extra loops until a fast, even climb is obtained. Fully wound, with a right-hand prop, the craft may dive in on the left wing. To remedy this, increase the incidence of the left wing by bending up the leading edge and

bending down the trailing edge. This is best done by bending the wire clips with pliers instead of breathing on wing. Known as "wash-in" this adjustment is one of the first to be found in the expert's bag of tricks.

When the cloud chaser is correctly adjusted it will be apparent that the model is a high and stable flyer; so unless you're out in the wide open spaces, it may be advisable to have the plane slightly underpowered. Remember that a plane in the hand is worth two in a tree.

When good flights become "old stuff" try experimenting with various sizes of rubber and loop lengths. Then fly the model with larger propellers and compare the duration of hand-launched with R.O.G. flights.

But either R.O.G. or hand-launched—you're bound to like this big sturdy flyer.

Table of Approximate Weights

Wing	.30 ounces
Stick	.56
Landing gear	.15
Propeller	.19
<hr/>	
Rubber	1.20 ounces
	.50
<hr/>	
	1.70 ounces complete ready to fly

Required Materials**Balsa Wood**

- (1) 3/8 x 1/2 x 28 inches.
- (2) 1/16 x 3/16 x 18 inches.
- (4) 1/8 x 3/16 x 18 inches.
- (2) 1/8 x 1/16 x 18 inches.

Half sheet of 1/20-inch sheet.

Half sheet of 1/16-inch sheet.

Half sheet of 1/8-inch sheet.

Block 1-3/4 x 1 x 12 or (12-inch machine cut prop blank).

3-ft. No. 14 wire.

Large thrust bearing.

14-ft. 1/8-in. flat rubber.

1/16-in. Bamboo or Reed (12 inches).

Sheet of White Tissue.

Dope, Cement, Washers, Thread.

GAS LINES*(Continued from page 25)*

Burlington, Iowa, who received a total of 256.5 points.

This performance event was something entirely new. Bob Sommers thinks it will eventually supplant the endurance event held so regularly in all countries, and would be glad to hear from contest directors interested in the event. Just drop a note to him in care of Stix, Baer & Fuller Co., St. Louis, Mo.

A special prize was given to the contestant who had the most outstanding development in design, regardless of type. Judged on adaptability and uniqueness, the award was given to Donald Lueke of St. Louis. David Seltzer, another St. Louisian, won the Stix, Baer & Fuller Trophy, awarded annually to the best local all-round contestant.

After the meet a dinner was given at the De Soto Hotel in St. Louis. There was lots of good entertainment, and outstanding speeches by George Page, Chief Engineer of Curtiss-Wright, Jim Malone, test pilot, and others. To add a special touch to the affair, Contest Director Sommers had the prizes awarded by a young actress.

The meet received a great deal of free

MARPELL—Streamlined Gas Model Wheels**Designed For Perfect Landings**

When your gas model... new and shining... comes gliding in it creates a prompt stir of interest—that pleased expectancy of a perfect landing. Safeguard your ship at this thrilling instant with Marpell wheels of exclusive streamlined RAISED-TREAD design. Truly light weight Marpell tires are vulcanized of the highest grade ebony-finished rubber. The hub is of heat treated, highly polished duraluminum with a bronze bearing. A patented "Air-Check" inflation valve holds air pressure indefinitely. Inflating adapter furnished.

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\$2.00

Your choice, 4 1/2" or 3 1/2" diam.
Bronze bearing fits 1/8" axel. Per pr., either size.....

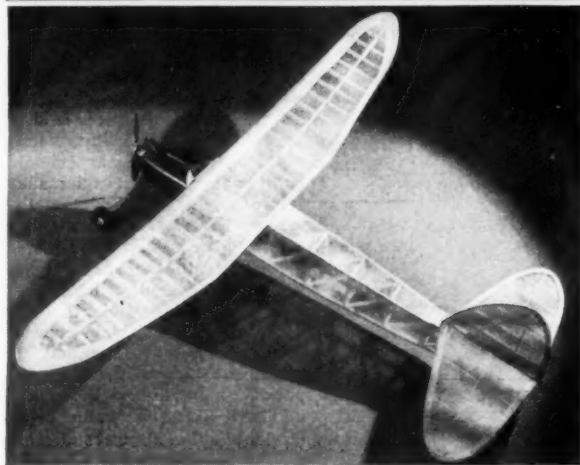
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Tail Wheel Included

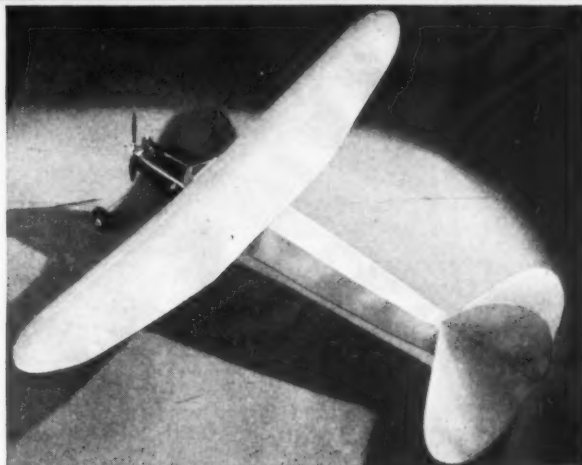
A new streamlined tail wheel of live rubber will be included with your order. This is not a fat, spongy, do-not type tail wheel, but is really streamlined with a molded-in bronze bearing.

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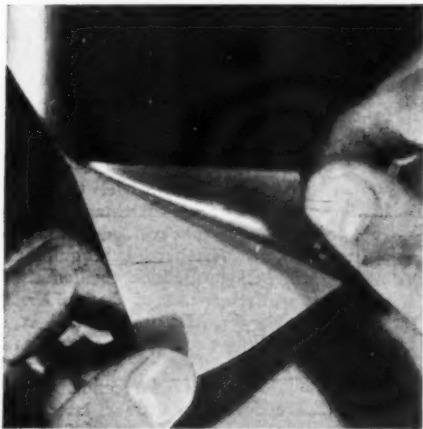
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This shows the transparent PLANEFILM covering—drumlike—all the intricate detail of the interior is clearly visible.



This shows the opaque PLANEFILM covering—drumlike—and Maximum high gloss finish.



Removing tough flexible PLANEFILM from its backing sheet ready to apply to any model.

WORKS LIKE MAGIC STRETCHES ITSELF—DRUMLIKE

No Wrinkles—No Seams

After many painstaking hours of tedious work, you finally complete the frame work of your model and find yourself confronted with the serious problem of covering it. The covering alone represents your finished model. It completely covers the frame work on which you pride yourself. Why, then, isn't it of the very utmost importance to get the most practical, efficient and attractive covering obtainable? The answer to this is PLANEFILM, a product developed after exhaustive research and study of the problems that caused every model builder innumerable heartaches. PLANEFILM is so simple and speedy to apply that the most inexperienced builder will marvel at his results. It is a REVOLUTIONARY DEVELOPMENT FOR COVERING MODEL PLANES that had never been conceived until now.

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No glue or dope necessary, patches easily, quickly and invisibly; ready for applying when it reaches your hands—tough, elastic, attractive, at least 50% lighter in weight—no seams, where you lap one piece of PLANEFILM over another—it actually becomes one smooth level single joint.

PLANEFILM stretches itself, drumlike, over the wings and fuselage, completely eliminating one of the most troublesome and tricky operations in covering a model plane; that is, stretching silk or paper over the frame, then brushing on dope, many coats of which are necessary to give it the appearance you wish—will not tear, but if it is pierced, the repair can be made in the field in a fraction of a minute on any size hole; then the ship is immediately ready to fly without further delay.

PLANEFILM is scientifically manufactured on micrometer machinery which is adjusted as close as ten thousandths of an

inch. THIS ASSURES YOU THAT WHEN YOU COVER, YOU HAVE AN ABSOLUTELY EVEN DISTRIBUTION OF WEIGHT AND PERFECT BALANCE SO NECESSARY TO GOOD PERFORMANCE.

PLANEFILM is attached to a backing sheet; therefore, it is easily handled, easy to cut to shape, as the film which is attached to a backing sheet is more or less stiff, but after you have cut the PLANEFILM to fit a particular part, you then strip the film from its backing sheet, and when you have the film removed from its backing sheet, it is soft, pliable, and actually forms itself to the many curves necessary in model building.

PLANEFILM comes in many colors. The speed of application is hardly believable—a 7 ft. wing spread was covered in 20 minutes.

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"PROFESSOR" KITS PIONEER 2 NEW FEATURES

54" JUNIOR MODEL FOR POPULAR 1/5 HP ENGINES GIVE AMAZING STRAIGHT-UP CLIMB — NEW STREAMLINED MONO-WHEEL LANDING GEAR — LESS DRAG — FLATTER GLIDES — BETTER LANDINGS

(Conventional two-wheel landing gear also included for those who prefer it)



SPECIFICATIONS

—3 Sizes to Choose From—

	JUNIOR	SENIOR	SUPER SENIOR
Span	54"	6 ft-1"	9 ft-2"
Length	41"	57 1/4"	87 1/2"
Wing Area, sq. Ft.	214"	454"	1054"
Weight, complete	28 oz.	39 oz.	6 lb. 5 oz.
Motor H.P.	Smallest to 1/5 H.P.		1/6 to 1/5
KIT PRICE complete			
less motor and wheels	\$4.95	\$5.95	\$14.50
Price with airwheels	\$5.65	\$7.50	\$16.25
Add postage and handling	25c	35c	75c
(unless bought from dealer)			

Motors may be upright or inverted

EASIER TO FLY—Special (only on Korf Kits) slow stalling wing tips (NACA 6412 airfoil)—Approx. 8 oz./sq. ft. wing loading—Low center of lateral area in line with center of gravity—high line of thrust.

MORE EFFICIENT—Fuselage of elliptical cross-section—expertly streamlined—elliptical planform wing—NACA 4512 airfoil (soaring section)—Low drag motor cowling—Special "T" section tail surfaces eliminates "blanketing effects."

PRACTICALLY CRASH PROOF—New type free-swinging, detachable wing. Soft balsa nose spinner protects motor—flexible landing gear—Quickly replaceable. "Breakaway" mounts protect motor and plane.

EASIER TO BUILD—Greatly simplified methods of construction—Many finished parts—Easy to read, full size plans—fully illustrated notes and details.

KITS ARE COMPLETE—Cutout and notched ribs, wing tips, and formers—turned balsa spinner for propeller—all strip and sheet balsa cut to size and of finest quality—plenty of material for battery box, motor mount, and other details—landing gear and tail skid wire—wheels—celluloid for windshield—wiring—hardware—bamboo paper—cement—clear and colored dopes—Easy to understand, full size drawings, clearly illustrated.

PLUS—"Testing Gas Models and Stability Facts" written by an Aeronautical Engineer.

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Dealers: Write for attractive proposition on your company letterhead.

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INDIANAPOLIS, INDIANA

publicity, with many pictures used, as well as two broadcasts directly from the field, several interviews and many spot announcements before the contest. Sommers and Publicity Manager Hanns Kolmar estimated the crowd watching the flights at about 3,500.

Picture No. 12 gives evidence of the large crowd which attended the contest. An exact scale Curtiss Robin is shown in the foreground.

On September 10th, the Quaker City Gas Model Airplane Association held its second annual Invitation Meet at Northeast Airport, Philadelphia, Pa. It was a huge success and attended by a large crowd of spectators. Events were held for engines with bore of more than 5/8" and less than 5/8"; an event for spectacular flying and an event for the duration ships in a "beauty" contest. (No "make-up" was allowed in this). The meet brought forth many outstanding designs. One of them was an exact scale model twin-engine Douglas transport. It is shown in picture No. 13.

Picture No. 14 shows a two-motored seaplane. It appears that model builders are wandering from the customary paths of design; which fact indicates that originality in builders is not entirely dead. We believe that this trend should be encouraged and that contest rules should not be such that they would discourage builders from working out their new ideas. These contest pictures were sent to us by Robert Hainley of 426 W. Chew Street, Philadelphia.

Atlanta, Georgia, is "coming to the fore." A large contest was held there on Labor Day by the Atlanta Aero Engineers of 2049 Robson Place, N.E.—an N.A.A. chapter. The club director is J. K. Coppage, who tells us they now have a membership of 45, and growing steadily. This club enjoys the distinction of being the first gas model chapter, obtaining its charter on December 16th, 1937.

Picture No. 15 shows a line-up of some of the planes and contestants who took part in the meet. More than \$350 in prizes were awarded by the Atlanta merchants and business men. First prizes were won by Frank Brittain and Ralph Blanchard of Atlanta, and Bob Hogsed of Gainesville, Ga. Brittain won both the senior construction and flying events. There were about 5000 spectators on hand to witness the flying.

Educating With Models

Young men who are taking up aviation as a career find that models serve as a very effective instrument in attaining the full understanding of aerodynamic principles. A great deal of foresight is shown by Mr. Parks of the Parks Air College: for he has installed a system of model designing and building to supplement the studies undertaken by the pupils attending his institute. Mr. Douglas T. Peck, president of the gas model club at Parks, states:

"It is hard to find a better way to learn the fundamentals of model aerodynamics than by building and flying as model air-

planes. The club membership represents eight states and Canada. Pooling ideas from various parts of the country, as we do in our meetings, broadens the viewpoint of each one and so makes our hobby of still greater value in preparing for aviation careers. For that matter, the reason that most of us are studying aviation is that when we were 13 or 14 years old we became ardent model builders and contestants. Our hobby was the deciding factor in the selection of our career field."

His interest in model building, Peck stated, dates from his grammar school days. Then it was that a friend made him a present of a year's subscription to MODEL AIRPLANE NEWS. As a result, he began the building of rubber band-powered planes. Visits to the home town airport followed. Gradually there developed a well defined determination to become a part of the new field. Accordingly, throughout high school, he made a determined effort to earn a creditable record, especially in math and the other sciences, for he realized the value of a solid foundation for his future study of aviation.

Picture No. 16 shows the busy workroom at this college with the members of the gas model club actively engaged.

Pete Dillen, president of the Jackson Gas Model Club of 636 St. Clair Street, Jackson, Michigan, writes and says that though he is rather late in reporting the contest held by the club on August 14th, he hopes we will pardon him. The official name of the contest was the second annual Rose City Gas Model Contest. It was attended by 64 contestants "and gobs of public." However, due to an eighteen mile wind, there were quite a number of crack-ups which thrilled the spectators at the expense of the builders. Walter Good of Kalamazoo, Michigan, came through in great style with two out-of-sight flights, the longest flight time being six minutes, eleven seconds. The ship was recovered one week later, 42 miles from the starting point. Second place went to Jack Raymond, flying a Condor-powered Thunder Bird. The procedure of running the contest was similar

THE CHALLENGER!



68" Wingspread—Wt. 3 lbs.—Power 1/6 or 1/5 H. P.

Due to the great demand for this model we are able to offer it to you at an amazingly low price. This kit is absolutely complete, and it is not necessary to buy another item to finish the model except for power plant.

A few contents of the complete kit are: Full size plans; ready cut wing and tail ribs; semi-finished prop; balloon type wheels; ignition equipment; all strip wood cut to correct size; special spring wire; all necessary liquids; etc. only \$4.85 P.P.

The Deluxe kit contains inflatable airwheels, colored dope, and a mahogany finished propeller (static size desired)—\$6.75 P.P.

See these kits at your dealer. If he can't supply you, order direct. Immediate delivery.

V. K. MODEL AIRPLANES & SUPPLIES

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For Competition or Fun FLY BESHAR MODELS

Beshar Models are scientifically designed and suitable for every builder. For competition the expert gets high climb and a flat glide on 30 seconds motor run. For the modeler who wants flying enjoyment, these models are easy to construct and extremely rugged for every day flying.

FLASH . . .

Corsairs win on 30 second motor run

1 place Syracuse	3.16
1 place Allentown	4.20
1 place Paoli	4.24

Proving its competitive abilities.



"ALPHA" CORSAIR

5 ft. 8 in. span for 1/5 to 1/3 horsepower motors. Weight 2 lbs. 6 oz. complete. Fits NAA rules. Kit complete with wood, glue, dope, wheels and finished prop. **\$4.75**

The "CORSAIRS"

The Corsairs lead in modern design with twin rudders for stability and easy adjusting. They have Super Stressed easy construction and Simplified tapered wing. The Kits are complete with 3 view plans, all wood, glue, etc., are of Beshar quality.

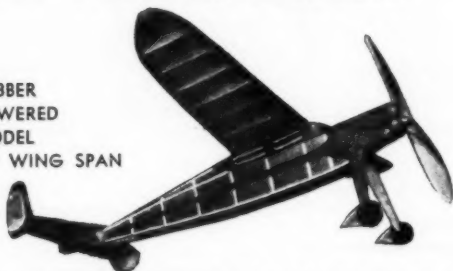
"BABY" CORSAIR

3 ft. 6 in. wing span for 1/7 to 1/12 horsepower small bore motors. Climbs spectacularly and glides like a soarer. Complete Kit with plenty of extras. **\$3.00**

New! THE "BRIGADIER"

RUBBER
POWERED
MODEL

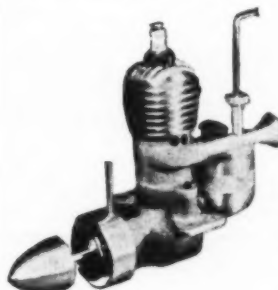
27" WING SPAN



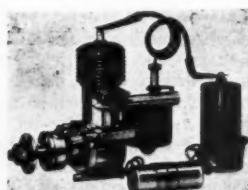
A beautiful modern rubber model that flies 1/2 mile and over 2 minutes, can be used for endurance contests. Complete Kit with prop. **\$7.75**

NEW SMALL BORE MOTOR...

THE "BANTAM"



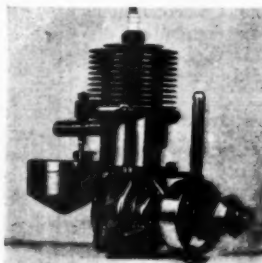
Approved by Beshar, designed by Ben Sherashaw; will fly models up to 36 oz. weight, has app. 1/8 horsepower and 1/4 bore and stroke. 500 to 10,000 R.P.M., and weighs 7 ounces with batteries. High Quality materials throughout and comes complete, mounted, tested, with coil and condenser. Order yours today. **\$16.50 P.P.**



OHLSOHN "23"

1/7 horsepower and quality workmanship

\$16.50



FORSTER BROS.

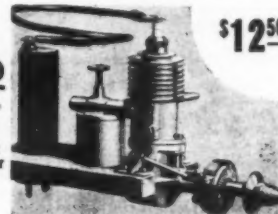
1/3 horsepower for large models and super power **\$17.75**



BROWN MOTOR

Model "D"
\$10.00
P.P.
Complete
READY TO RUN
With Coil & Condenser

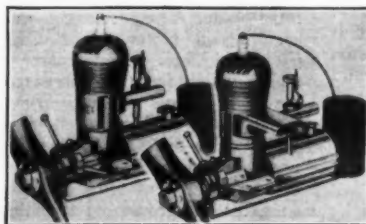
MODEL
B \$21.50
C \$17.00



\$12.50

HUSKY JV.

For Small Models, the new 1938 Husky JV. Weighs only 4 1/2 ounces, can be used inverted. Needs no condenser, as it has a combination coil. For models 3 to 5 feet it is the wonder motor at the wonder price.



BUNCH MOTORS

All Bunch engines full 1/4 H.P. at 5200 R.P.M.; 1/4 H.P. at 8500 R.P.M.; Bore 7/8"; Stroke 1 1/2"; Bare weight 6 1/2 ozs.

Engines assembled and block tested, or kits are complete with coil, condenser, fuel tank, and Champion spark plug. Engine kits supplied with piston, piston rings, and main bearing fitted, ready to run, and with timer assembly set up and points adjusted, so that the engines can be assembled and tested within one hour's time.

MIGHTY MIDGET Upright Assembled	\$ 9.50
MIGHTY MIDGET Upright Kit	7.85
MIGHTY MIDGET Inverted Assembled	9.75
MIGHTY MIDGET Inverted Kit	7.85
GWIN AERO Upright Assembled	12.00
GWIN AERO Upright Kit	9.85
GWIN AERO Inverted Assembled	12.50
GWIN AERO Inverted Kit	9.85

3 1/2" Air Wheels	\$1.50
Austin Timer	1.25
Coils (best obtainable)	1.50
Pt. Berryloid Cement	.60
Pt. Berryloid Dope (clear or colored)	.50
Condensers (best)	.15
Booster Plugs (set)	.30
Silk, Sq. Yd.	.45
Bamboo Paper, 24x36	.05

BESHAR MODELS —
329 EAST 54 STREET
NEW YORK, N.Y.

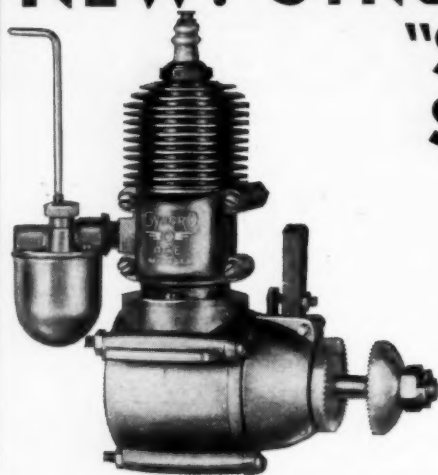
The greatest name
in model planes

NEW! SYNCRO ACE

"SPECIAL"

\$9.95

At your
Dealer



A New Model
Vertical or Inverted Mounting
without Dismantling
Parts Interchangeable with
Standard Syncro ACE
The Ideal Contest Motor

For many months, model builders and dealers have asked us to produce a motor that had the unexcelled performance of the Syncro ACE at a low price. One of those seemingly impossible jobs. But we have done it. It has been made possible partly by certain changes in design; and partly by economies due to increased production. Best of all, there has been no sacrifice of quality. The Syncro ACE "SPECIAL" gives you PERFORMANCE—performance found in no other engine—at a price that makes it easy for you to have the best.

ASK YOUR DEALER

Have him show you this outstanding engine. Or write for illustrated literature containing complete specifications.

SYNCRO DEVICES, INC.

523 Boydell Bldg.
Detroit, Mich.

HERE is something new for you fellows who build flying model airplanes.

SCALE MODEL SUBMARINE S-30

19" lg. with adjustable fins, water ballast chamber and air valve control for diving. Runs on surface or under water. Die cast conning tower, naval gun and keel parts. Brass propeller assembly.
13 inch model completely assembled. \$2.50 P.P.
13 inch model kit (40 parts). \$1.50 P.P.

SCALE MODEL SUB CHASER CP-375
20" lg. 1/4" beam with heavy duty spring motor driving twin screws thru a magnet gear set. Kit includes completely machined hull, mechanical drive parts, stamped aluminum cabin, windshield & lifeboat, die cast oval gun and ventilators. Brass propellers and trim.
Ready to assemble. \$2.75 P.P. Completely assembled in Navy Colors. \$3.95 P.P.

Send for FREE catalog of other models
WESTLAKE MODEL CO., Dept. M-128 ERIE, PA.

Howes REDUCED

ADJUSTABLE PITCH PROPELLER



PRICE, NOW \$1.75

This is the finest and most beautiful propeller that has ever been manufactured. In our files there are statements telling of its efficiency and great success.

The blades are held firmly in the hub and cannot fly off. The diameter is 14" and the shaft hole is 1/4". This propeller is designed for gas engines of 1/6 to 1/4 H. P. and may be adjusted when on the motor.

For rush orders send to us now if your dealer does not carry them.

HOWES PROPELLER CO.
Fairview Ave., Stamford, Conn.

to the Nationals and worked out exceedingly well. Mr. Arthur Vhay was a great help in organizing the system by means of which records of the flights were kept.

Picture No. 17 shows a tense moment in the life of any gas modelist: "Will she or won't she?" is the question here. We know that it did—go up.

1938 Junior Air Races

Edward L. Semler of 1255 Collinwood Avenue, Akron, Ohio, has been kind enough to send us a report and some pictures of this year's Junior Air Races, held in this city recently.

Almost within the shadow of the huge Goodyear Zeppelin Dock on the spacious Akron, Ohio, airport, model ships representing the entire nation battled for supremacy during four days of stiff competition.

Seven big events were scheduled on the program, with a total of \$2500.00 in trophies, cash and model supplies. Tuesday, August 30, the Goodyear, Vincent Bendix and Peerless trophies were offered. Wednesday, August 31, the United Airlines, the B. F. Goodrich and the Aero-Industries Technical Institute trophies were offered. On Thursday, September 1, the Thompson Junior Speed, the L. W. Greve original design, the Sperry and the "Men with Wings" events were held. On Friday, September 2, the Stinson and the Texaco gasoline powered events were held. The Grand Prize was a week's trip to Hollywood by the United Air Lines Mainliner.

The meet was recognized by the public

on August 28, when Aviation Day attracted the largest crowd ever to attend the Akron airport. Before this huge crowd, and surrounded by an armada of real ships, a number of gas model constructors launched their ships in a successful efficiency demonstration.

The Junior Air Race contestants were then treated to thrilling stunts by navy ships from Grosse Ile, Michigan, to precision stunts by Lieutenant Joe Mackey, who later distinguished himself on September 5 during the Thompson Trophy race, to an 8,000 foot batwing jump by Merle Auken and by the aerial bombing of a fort by Major Al Williams.

Tuesday, July 30, delayed the race with rain and a high wind. Later in the afternoon, the sun blazed and the wind receded to a gentle breeze to permit a few entrants to place in the cabin model events.

Wednesday, July 31, offered a warm sun and a medium breeze for the completion of the cabin model events.

Anthony Kazloukas of Akron, sent his streamlined rubber-band-powered cabin model on a 22:56 2-5 minute flight and to victory in the Senior Class. His prize consisted of the Peerless Trophy, \$15.00 in cash, a reserved seat ticket to the Cleveland National Air Races and a wrist watch. Ted Just, of Johnstown, Pa., won second place with a flight of 15:24.

Robert Pfeifer of Cleveland, won the coveted Vincent Bendix trophy, the \$15.00 prize and the reserved Air Race ticket of the Junior Class, with a flight of 3:37 1-5 minutes. William Kalman, of Akron, came in second with 3:12.

Mike Karlack won the Open Class with a flight time of 11:21 3-5, to receive the B. F. Goodrich Trophy, \$15.00 cash and a ticket to the Air Races. Arthur Ech, of Johnstown, Pa., placed second with a flight of 11:3.

Thursday, September 1, brought a stiffer breeze and a pleasant sun, and saw the speed event ships flash down the 176 foot course at a speed of 60.2 m.p.h. Jerry Kolb of Cleveland, Edward Smith of Pittsburgh and Richard Korda of Cleveland, each flew their ships at 60.2 m.p.h. and drew lots for the trophy and divided the prize money evenly among themselves. The winner of the 1937 event attained an average speed of 75 m.p.h.

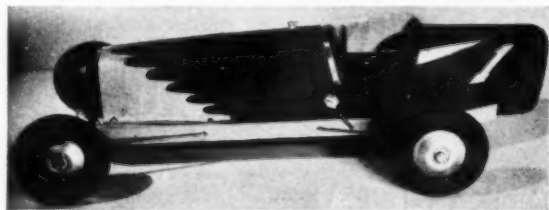
Tasso Pappas of Akron designed a helicopter model, which he refers to as his "gyrocopter tower," and took first place in the original design contest. This helicopter has four blades, with a rubber-band-motor and prop on the first and the third blade. The fuselage is vertical, resembling a tower. Ray Campbell of Cleveland took second place with his model which featured increased take-off speed by means of auxiliary wing tips which could be lengthened or shortened.

Don Kowalick of Rockford, Ill., won first place in the Junior Class of the Outdoor Stick Event with a flight time of 4:24. Edward Smith of Washington, Pa., took first place in the Senior Class with the time of 11:57. Leonard Becker of Lakewood, Ohio, won first place in the Open Class with a flight of 6:19 4-5.

Nineteen models competed in the finest concentration of exhibition scale models ever assembled in Akron. After four

For Christmas—REGINALD DENNY SENDS YOU BEST WISHES AND BRINGS YOU NEW ADDITIONS TO HIS FAMOUS LINE FOR 1939!

**A BRAND NEW SPORT IN GAS MODELS! The Denny Industries
have been appointed exclusive distributors for the
STRAIGHTAWAY KING GAS MODEL RACE CAR**

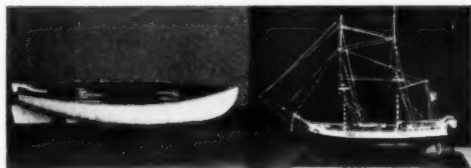


21" OVERALL. OWNERS REPORT 45 M.P.H.

Complete kit. Consists of drilled steel frame, cutout metal body, 4 wheels with rubber tires, formed axles, springs, and tie rods. Also has motor mounts, exhaust pipe, upholstery, gears, chain drive, flywheel, etc. Can be assembled in two hours. Powered with any 1/5 h.p. motor.

Kit, less motor **\$10.00** | When purchased with Denny motor **\$9.25**

ALSO ANNOUNCING—THE DENNYETTES



WHALER



SLAVE PRIVATEER



SUBMARINE

TRAMP STEAMER

HARBOR TUG

Five new kits to add to the Denny line. Beautiful little miniatures of authentic ships—just what you have always wanted. Six inch models in complete detail. Kits consist of all materials, printed hull, Berryloid Speedline Enamel, lills, fittings, etc.

35c each

NEW 1939 EDITION OF THE DENNY JR. A famous airplane with the newest improvements. Longer moment arm, more stability, faster climb. No increase in price. Standard, complete with wheels, covering, etc. **\$9.50**

Deluxe with finished metal parts, 4 1/2" airwheels, etc. **\$12.50**

Denny Streamline Airwheels complete with inflator. 2 1/2 inch—\$1.25.
3 1/2 inch—\$1.50. 4 1/2 inch—\$1.75.

Have you noticed the consistency with which the AIRSTREAM DENNYMITE is winning the big contests? Power your plane with this fine motor and be "in the money" too.

DELUXE, with long exhaust, special choke, dural mounts, etc. **\$17.85**

STANDARD, same except for exhaust, choke and motor mounts. **\$15.85**

UNIT, without coil and condenser but the same fine motor. **\$13.85**

REGINALD DENNY INDUSTRIES, Inc.

5751 Hollywood Boulevard,

Hollywood, California

hours deliberation, the judges awarded first prize to Peter Zaleski of Cleveland. Second place was awarded to Max Sokol of Hamtramck, Michigan.

The meet featured a radio-controlled plane, entered by Walter and William Good of Kalamazoo, Michigan. This beautiful model, painted yellow, is capable of flying at the rate of 10 m.p.h., but was grounded by a persistent wind of greater speed. The model has an eight foot wing spread, is technically correct in every minute detail, and is controlled in the air by means of a radio set which regulates the ship's rudder.

Friday, September 2, provided pleasant weather but a changeable wind, necessitating constant surveillance of the wind direction. The staccato barking of the tiny power plants accompanied the opening of the gas model events. For six hours the large models climbed from the board runways, motors sobbing as they fought for altitude before their meager supply of "soup" gave out. Ships banked

and glided overhead in both official and test flights. Carroll Krupp sent his unique balsam-pannelled-fuselage model aloft on its trial and official flight all in one. He barely finished the model in time for the race. The model features a single wheel and a one-bladed propeller. Robert Besse appeared on the field with a nine pound sensational low-wing monoplane that caught the admiration of the spectators. Unfortunately, it nosed down from a three foot altitude on its trial flight. Mr. Besse viewed this experiment with favor, and discounted the mishap, believing that the demonstration and experience was worthy of his efforts.

Walter Good of Kalamazoo, Mich., won first place in the Open Class with the flight time of 24:4 1-5. Carl Goldberg of Chicago, took second place with a flight of 8:15 3-5. Jack Deitz of Cincinnati, Ohio, won first place in the Senior Class, with a flight time of 16:48. Robert Hoffmeyer of Akron, came in second with 4:12 3-5.

William Good of Kalamazoo, Mich., became King of the Air Races upon the award of the contest Grand Prize—a week's trip to Hollywood, Calif., on a United Airlines "sleeper plane."

Picture No. 18 shows Bud Chapman, who came all the way from California, ready to release his ship for a take off.

In picture No. 19 Carroll Krupp of Akron is shown holding his single wheel, one-bladed propeller gas job.

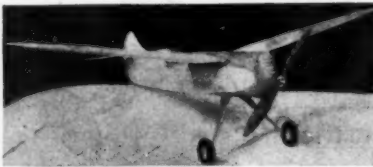
In picture No. 20 Major Alford Williams, Walter Good and Bud Chapman examine one of the winning models.

California

Irish Truelson, secretary of the Gas Model Airplane Association of Southern California Inc., writes, telling us of the activities of this club. He says:

"We held another club contest Sept. 25, the so-called 'precision' type. Precision if you win and tough luck if you don't. Jim Williams won first place with his

a new streamlined sensation - - - the Lancer



Thunder Birds Win 1st-2nd-3rd-4th-5th In Recent Meets

"45" wins 2nd competing against 60 large jobs. Time 3 min. 15 sec.
Complete 45" kit includes cut out ribs and formers, shaped trailing edges, prop blank, full size plans, cement, dope, air wheels, etc. **\$4.95 p.p.**
With colored dope and a finished prop (state size) **\$5.50 p.p.**
Complete 6" kit includes cut out ribs and formers, shaped trailing edges, prop blank, cement, dope, streamlined air wheels, etc. **\$4.95 p.p.**
With colored dopes and finished prop (state size) **\$5.95 p.p.** Weight with motor 3 1/2 lbs.

Catalog free on request

Describes recommended motors and accessories for these models

NEW CYCLONE AIRCRAFT CO. (Dept. A4) 166 Richards St., Brooklyn, N. Y.

A simple high performance type gas job. Available in 45" and 6" sizes. 45" model employs monocoque construction that can be completed in less time than ordinary types. Stronger and easier to build. Employs tapered wing. Motor can be mounted upright or inverted. Complete 45" kit contains all necessary wood, wire, cement, dope, cut out ribs and formers, shaped trailing edges, air wheels, etc. Weight with motor 29 oz. **\$2.95 p.p.**
With colored dope and a finished prop (state size) **\$3.50 p.p.**
6" model contains all necessary materials, prop blank, cut out ribs and formers, shaped trailing edges, streamlined air wheels, etc. **\$4.95 p.p.**
With colored dopes and a finished prop (state size) **\$5.95 p.p.**



300 PINS and RINGS SHOWN IN BASTIAN'S FREE 1939 CATALOG

BIGGEST SELECTION, low prices, traditional Bastian quality—the combination that has kept Bastian out in front 48 years. Pins in 2 colors with any 3 or 4 letters and year. Handmade Sterling silver rings. Chain cut work distinguishes Bastian. Pins and Rings everywhere. Oldest, largest makers.
Write for the new catalog today!

BASTIAN BROS., Dept. 91, Rochester, N.Y.

PARAMOUNT Quality Supplies

Only the finest tested materials are sold by PARAMOUNT. It is our desire to make a friend of every customer. We invite YOU to be one of our SATISFIED friends. We guarantee highest quality at bargain prices.

The Double Value Line

STRAIGHT GRAIN HARD BALSA	BEST GRADE COLORED DOPE
Picked for gas model use	
3 ft. Balsa	
1/2 x 1/4.....2 for 8c	1 oz.....12c
1/2 x 1/2.....2 for 13c	2 oz.....20c
1/2 x 1.....2 for 15c	3/4 pt. can.....35c
3/16 x 3/16.....2 for 28c	1 qt. can.....70c
3/16 x 1/4.....2 for 15c	1 qt. can.....\$1.25
3/16 x 1.....2 for 17c	
1/2 x 1/4.....6 for 28c	2 1/2 in. dia.....\$1.25
1/2 x 1.....2 for 28c	3 1/2 in. dia.....\$1.50
3/8 x 1/2.....2 for 28c	4 1/2 in. dia.....\$1.75
3/8 x 1.....2 for 28c	N & M AIR WHEELS
1/2 x 1/2.....2 for 27c	3 1/2 in. dia.....\$2.75
1/2 x 1.....2 for 28c	4 1/2 in. dia.....\$2.75
1 1/2 x 1.....2 for 28c	
1 1/2 x 1.....2 for 28c	
	GAS MODEL PROPS
	10 in. dia.....80c
	12 in. dia.....80c
	14 in. dia.....70c
	15 in. dia.....75c
	16 in. dia.....85c
	18 in. dia.....\$1.00
	20 in. dia.....\$1.25
	BASSWOOD PROP
	BLANKS
	8c 12 in. dia.....20c
	8c 13 in. dia.....25c
	8c 14 in. dia.....25c
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How To Order

No order accepted for less than \$1.00. Add 10% for postage. No C.O.D. Fast delivery guaranteed from our large stock.

We carry a complete line of gas motors and parts. Brown Jr., Model B \$21.50, Model C \$17.50, Model D \$10.00. Ohlsson Model 25 \$16.50, Gold Seal \$15.50.

Paramount Model Airplanes

51 Humboldt St. Brooklyn, N. Y.

Ohlsson powered ship. He was flying two Ohlsson-powered and one Phantom-powered ships. He beat Tom Truelson's Trojan-powered ship by 1 1/2 seconds.

"A night flying party was held Sept. 30. About 30 ships turned out, and Bud Warren provided a spot light. All ships were equipped with lights. For those that haven't tried this, may we state it's a real thrill that will 'pep up' the most jaded model flyer. The lights were run from the regular battery without interfering with the motor. Ships were easy to find as the lights were visible for long distances.

"Our semi-annual contest will be held Dec. 11, 1938. Rules will be the same as usual: High-Wing and Low-Wing monos not less than 12 oz. to sq. ft.; Biplanes and Class B ships (Class B is ships of not over 300 sq. in.) No weight rule; 30 sec. engine run—climb them as fast as you can and pray loud and fast. This contest is open to every one having 50c entry fee. No helpers are at the starting line, but may be in the pits. Manufacturers and dealers may, if they are able to take first, have the honor and the trophy but not the cash that goes with first place.

"We are holding a series of club contests to determine who will get the trip to the next Nationals with all expenses paid. This trip is made possible by the cooperation of our manufacturing members. Mr. Paul Whittier of Denny Industries, Mr. Dan Bunch of Bunch Model Airplane Co., Irwin Ohlsson of Ohlsson Miniatures and Barney Snyder of Modelcraft. The winner, who must be a club member, will receive \$150 to cover his expenses' to the 1939 Nationals."

New York

Mr. Irwin Polk of 421 Seventh Avenue, New York City, sends us the following notice:

Model Airplane Clubs Organize

An association of model airplane clubs in the metropolitan area of New York City was formed Thursday evening, September 1st, at a meeting of representatives of eleven leading model clubs in this section.

Irwin S. Polk, Director of the Metropolitan Model League, and active in the promotion of model aviation for some twelve years, was elected Chairman. Wm. Effinger of the Majestic Aero Club was elected Secretary.

The purpose of the association is to guide and direct the aeronautical interest and activities of the air-minded youth in the metropolitan area through proper leadership and supervision of model competition. Due to the rapidly mounting interest in the building of larger models powered with gas engines, it has become necessary for further organization to meet new conditions. Under the guidance of the National Aeronautical Association, and in compliance with the Bureau of Air Commerce, a licensing system for powered models has been set up for establishing self-supervision by model builders, adherence to fair and reasonable operation rules, with provision of penalty for violators.

By licensing, each gas model builder gains official recognition for his work, and has the opportunity of sharing in the move to establish, for gas model building, the important place it deserves in the nation's aviation training program.

Model aircraft building in this area is seriously handicapped by the lack of a proper flying field, and one of the most important objectives of the Association will be to obtain a place where model builders can fly their miniature aircraft away from congested or restricted areas, and where they will not prove a menace to the public.

A similar organization in Los Angeles has been able to obtain a large area which has been designated as a model airport to the exclusion of full sized planes.

Many countries abroad subsidize the model aircraft activity, which is an important source of future pilots, thus playing a valuable part in the future of national defense. The Association hopes to enlist the support of interested individuals or organizations to help secure a flying field. All model clubs in the New York metropolitan area are invited to affiliate with the association.

New Jersey

Frank Boyd, secretary of the Queen City Gas Model Club of New Jersey of 1800 Myrtle Avenue, Plainfield, N.J., sends us the following news about a contest they recently held. He says:

"The First Annual Open Meet of the Queen City Gas Model Club was held at Hadley Airport on Sept. 17, 1938, under the direction of N.A.A. Contest Director

(Continued on page 69)

Air Ways

(Continued from page 29)

Model News from Other Countries England

We venture to say that Mr. W. Rigby of 45 Valleyfield Road, Streatham S.W. 16, England, is the foremost authority on the art of paper-building model work in the world. He sends us picture No. 9, showing one of his latest creations. The unusual thing about this ship is its size, or rather

lack of it. Its span is about 5-3/8 inches and it flies about forty feet; on many occasions taking off from a small table. It may be conveniently packed into a box which will fit into a trouser pocket. The whole ship is made of note-paper except for the wooden propeller nose, propeller and wheels. You will note that it is resting on a small match box, which will help give you an idea of its actual size.

Mr. C. S. Rushbrooke of 14 Ennerdale Drive, Ashton-on-Mersey, Sale, Cheshire, England, who is undoubtedly familiar to many of our readers, writes and tells us some of the news of the Lancashire Model Aircraft Society of which he is Hon. Secretary and Treasurer. He says:

"There has been great activity in this club, and once again we won the National Inter-club Shield; the only club so far to hold this trophy twice. The club also won the National Gliding Cup, breaking the existing record at the same time with a flight of two minutes, twenty-three seconds out of sight, catapult launch. Records over here suffer in comparison with American times; owing largely to the fact that we still are not allowed to follow the model."

Picture No. 10 shows a group of the club members with some of their ships. Mr. Rushbrooke further says that he is looking forward to seeing more American model builders at the Wakefield contest. In this he is very optimistic, inasmuch as he infers that the Wakefield Cup will continue to reside in Europe. Now that he is in America, we have hopes of seeing Mr. Rushbrooke here in 1939.

New Zealand

William C. Munro of 174 Ythar Street, New Zealand, sends us picture No. 11, showing a group of members of the Southland Model Aero Club. It is evident that they go in for model aviation from "soup to nuts." In the picture members exhibit nearly every possible type of model; from small rubber models to a seven foot gas job. The club captain is Mr. A. Robinson who is on the extreme right. Mr. Munro is shown second from the left, standing. This club enjoys the distinction of being the model club which is farther south than any other club in the world; and they hold the New Zealand outdoor fuselage record of fifteen minutes, fifteen seconds. Some of the older members have turned to gas models and six motors are now on order.

There has been considerable controversy between Gordon P. S. Smith of Brougham Street, New Plymouth, New Zealand, and several aviation fans of New Zealand, concerning the reason for New Zealand buying planes from the United States rather than Great Britain. Mr. Smith wants to know why the airways of New Zealand have gone so far ahead since the ban against the purchase of foreign planes has been lifted and American planes have been bought by New Zealand air lines. He wants to know, also, why Australia uses all American transports if British transports are best. He sends us the following clipping from one of the local New Zealand papers, which helps substantiate his contention. It reads:

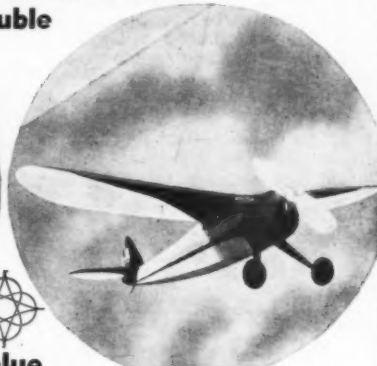
"The criticism here about Australia's purchase of American aeroplanes for long-distance commercial services is recalled by

SOMETHING DIFFERENT THE HUMMING BIRD

Midget Gas Model

Acclaimed By All Modeldom!

Double



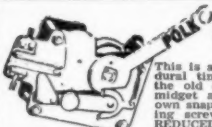
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Value

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MONOPLANE

At last a highly successful sensationally different gas model for small bore engines. Exceedingly simple to build, a reliable performer for competition or sport. Combines the variety of two models in one quickly interchangeable ship. What you've been waiting for!
Note these features:—THE HUMMING BIRD IS THE ONLY MODEL DESIGNED TO FLY AS A BIPLANE OR MONOPLANE • REMOVABLE POWER UNIT • READY CUT NOTCHED RIBS • M & M PNEUMATIC WHEELS • COLORED BAMBOO PAPER • SHAPED PROPELLER • FULL SIZE PLANS • DESIGN BY FRANK EHRLING • SIMPLE CONSTRUCTION • BERRYLOID LIQUIDS • 100% COMPLETE KIT • ONLY **\$3.95** POST PAID



WHY LOSE YOUR SHIP?

This is a brand new featherweight dural timer. Half the weight of the old one. Just the thing for midget and contest models. Has own snap action switch and mounting screws. From 0 to 35 sec. REDUCED TO.....\$2.00



"SEA SPRAY"

De Luxe Kit can be rapidly assembled into a sleek, handsome, Rugged Speedboat. Not a piece of balsa in it. Decks and bottom made of expensive Aircraft Specification plywood. Heavily cut bulkheads with accurately cut slots. Water-proof battery case, cast bronze hi-speed propeller and strut. Heavily made stuffing box, nails, screws, air vents, wire, cement, etc.

De Luxe Kit \$7.50 to \$5.00 Standard Kit Less Fittings



Model Aeronautics
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EXHAUST MANIFOLD
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Fits all models of Brown Jr. and Mighty Midget engines.



POLK'S PERFECT PITCH
SHAPED PROPELLER

JUST SAND IT!

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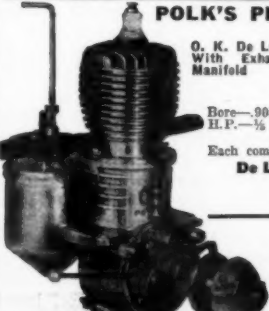
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SMALL BORE MOTORS
WE HAVE THEM ALL



Obison "23" 1/2" Bore—1/2" Str. Terrific Power \$16.50
Brat \$16.50
Husky \$12.50
Pee-Wee \$14.50
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Most complete gas model catalog 5c. Discounts to Legitimate Dealers. (Write on Letterhead).



O. K. De Luxe With Exhaust Manifold

Here—900" H.P.—1/2 plus

Each complete pre-tested, guaranteed and ready to run

De LUXE \$21.00 STANDARD \$17.50 SPECIAL \$11.50

O. K. THE O. K.
AN EASY STARTER
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Specifications Stroke 31/32" R.P.M. 10-12,000

THREE MODELS

Complete with coil etc.



O.K. Special

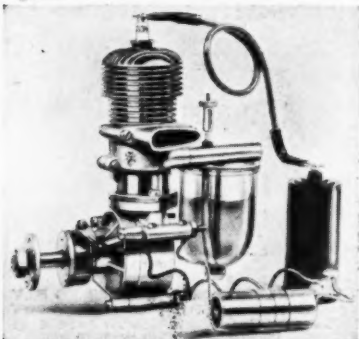
POLK'S MODEL CRAFT HOBBIES

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425 SEVENTH AVE. (bet. 33rd & 34th Sts.) NEW YORK, N.Y.

TWO OHLSSONS TWO Champions!

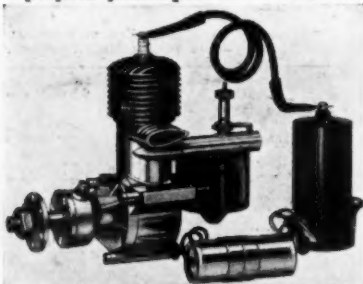
Ohlsson Miniature Motors are built by men who have spent more than ten years in the model motor business—they know motors—and best of all, they know what you, as a model fan, expect from a motor!

Buy an Ohlsson—and fly a champion!



the OHLSSON "Gold Seal"

For years the stand-by of model fans the world over. It has proven its superior performance ability in countless major model meets. Fully pretested and guaranteed. At your dealers or by **\$18.50** prepaid parcel post



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Designed specifically for flying the smaller jobs. Ask your dealer for a demonstration of this motor. See and hear it run! The Ohlsson "23" will outperform any comparable engine on the market! At your dealers or by **\$16.50** parcel post.....

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MINIATURES

630 NORTH ALVARADO STREET
LOS ANGELES, CALIFORNIA

the decision of British Airways Services to acquire four Lockheed aeroplanes from the United States costing \$70,000 for the London-West Africa route.

"It was stated a few years ago that Australia should have purchased British machines despite the fact that a type suitable for long distances was not manufactured, but vindication of the Commonwealth's policy appeared in the Cadman report admitting the non-existence of long-distance British commercial aircraft.

"An announcement in connection with Britain's purchase says: 'It is not policy to purchase foreign aircraft, but the only alternative is postponement of the development of routes exploited by foreign companies.'"

Belgium

One of our oldest foreign readers is Mr. Alfred Van Wymersch of 14 rue Berken-dael, Forest, Brussels, Belgium; his remarks have been gracing the pages of MODEL AIRPLANE NEWS for the past six years. This year he entered the Wakefield Competition in France and had what was considered to be the most beautiful model in the contest. This is shown in picture No. 12, and has a beautifully "streamed" monocoque body with a one-bladed propeller. The wings are in two parts, fastened on with shear pins. Mr. Van Wymersch has worked out an automatic down thrust which he believes is an original idea. After the initial burst of power is gone the down thrust is reduced. In this manner the tendency to stall is corrected; the amount of correction being reduced as the motor unwinds, and the power grows less. This ship won third place among the Wakefield contestants and it makes regular, consistent flights of over three minutes in calm, dull weather. Readers may look forward to seeing plans of this ship in an early coming issue of this magazine.

Canada

Mr. W. W. Ireland of 10576, 112 Street, Edmonton, Alberta, Canada, writes and tells us something of the history of model aviation in Edmonton. He says:

"Edmonton, Alberta, has the possibility of being one of, if not the, biggest airports in the world; though to date you have not heard much of model activities. On March 24th, 1938, a group of gentlemen, known as the Model Aircraft League of Alberta during the years of 1926 to 1931, reorganized with the object of conducting contests.

"The new organization elected me secretary-treasurer, and a meeting of all boys interested in model building and flying was immediately held. Sixty-five boys and ten parents attended; and nine new clubs were started.

"One club which has been established since November, 1936—the Alberta Model Flyers—has sixteen gas powered models; one member having three gas models but only one engine. We know it will take a 'go ahead' club to beat this, and we are all working to this end. From time to time we will keep you informed of our activities."

France

The 16th International Air Show, which is to be held at the Grand Palais des Champs-Elysees, Paris, France, has been definitely scheduled for November 18th to

DEALERS! CLUBS!

**FREE
WITH EVERY
ORDER**

One Dozen (Assorted)

15" FLYING KITS

Valued at \$1.20

ABSOLUTELY FREE

WITH EVERY ORDER

BALSA WOOD For 36" lengths, double cost of 18" size.	18" Strips Per 200	DOWELS 1/16 x 12" 18 1/8 x 18" 23 3/16 x 36" 35 1 Doz. 35	BALSA CARVED PROPS. 5" Doz. 30 6" Doz. 38 7" Doz. 43 8" Doz. 48 10" 6 for. 40 12" 6 for. 55	PAULOWNIA WOOD HAND- CARVED STAND- ARD PROPS. 5" 6 for. 25 6" 6 for. 35 7" 6 for. 40 8" 6 for. 45 10" 3 for. 30	BALSA HARDWOOD WHEELS 1 1/2" Doz. 09 3 1/2" Doz. 11 1 1/2" Doz. 14 1 3/4" Doz. 15 1 1/2" Doz. 25 2" Doz. 43	HARDWOOD NOSE PLUGS One Dozen 05	SANDPAPER 6 assorted sheets to package. 12 12 Packages. 34	COLORLESS CEMENT OR CLEAN DOPE 1/2 oz. Bottles. 30 1 oz. Bottles. 40 3 oz. Cans. 59 6 for. 75 1 Quart. 150 Gallon. 350	COLORLESS DOPE 1/2 oz. Bottles. 35 1 oz. Bottle. 50 1 Doz. 59 3 for. 60 6 for. 75	MODEL DOPE BRUSHES Small Doz. 10 1 1/2" 12 for. 40 Gross 75 3" 6 for. 55	ORDERING INSTRUCTIONS 1. No order under \$2.50 accepted. 2. Send cash with order. No C.O.D. 3. All orders shipped by express—shipping charges collect. Save time! Cash no more than postage. 4. Add 25c for packing on 12 free kits.
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CEMENT

AT SENSATIONAL PRICES!

• Here are the greatest bargains ever offered in a guaranteed, Grade A model cement. Buy in quantity and save. Impossible to overstock; nothing sells faster. This quality product suitable for gas jobs, as well as other types.
1/2 oz. Btls., per gross (144) \$2.75
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Quart Cans, 4 Cans. \$1.95
1 Gallon Can \$1.50
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Remit with order. Shipment express,
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MODEL AIRPLANE UTILITY CO.

5307 New Utrecht Ave., Dept. N-12, Brooklyn, N. Y.

December 4th. All those who wish to exhibit should get their applications in without delay. These should be sent to the General Commissioner's Office, 4 rue Galilee, Paris.

Russia

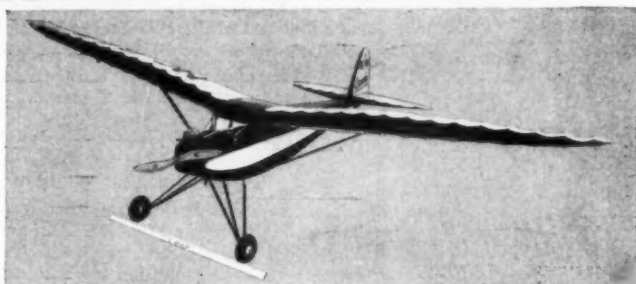
Picture No. 13 comes from Russia, and shows two young Russian model builders testing their hydros. In Russia model building by every young man is a requirement in the schools. In this way the younger generation becomes intimately acquainted with details of design and construction of aircraft. Most of the pupils seem to have a natural bent for their work.

MODEL NEWS

Pittsburgh

Charles E. Sholes, treasurer of the Tri-State Model Association of 524 Griffith Street, Pittsburgh, Pa., writes and tells us

Radio Control!



The "Oriole" Prefabricated Gas Model

Consider its possibilities and the broad field for experimentation. We have just the plane and power plant complete expressly for this purpose, ideal for photography, etc.

ANNOUNCING with the same complete "ORIOLE" prefabricated kit including new improved shock absorbing landing gear, detachable externally by merely releasing two hooks and removing three bolts, our new (interchangeable) high lift gull wings and the "MERCURY" engine incorporating all the power, performance, light-weight, quality and durability that can be desired.

For the discriminating model builder who wants and expects results at lowest cost without patient taxing labor. A plane and engine complete giving exceptional excellent performance and durability enabling you to proceed with utmost confidence to make desired installations.

PRICES F. O. B.—ORIOLE prefabricated kit with regular (optional) or new high lift gull wings. Span 10 ft. 7 in. Length 75 in. Height 20 3/8 in. Weight complete including 4 1/2 in. M & M wheels ready to fly, 11 lbs. 12 1/2 oz. \$21.50
Dry Kit, less wheels, dope and cement. 14.75
MERCURY ENGINE less propeller 25.00
Special recommended propeller 3.50

Send for particulars

AVION MODEL AIRCRAFT MFG. CO.
P. O. Box 906 Woonsocket, R. I.



The Mercury Engine

Engine Specifications: Material

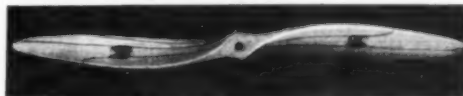
Duralumin, high carbon steel, high speed bronze, precision ball-bearings, alloy pistons and special rings.

Weight:

Engine with tank (separate to place near center of gravity) and 14 in. of neoprene fuel line, 1 lb. 3 3/4 oz.
With propeller made to order 1 lb. 8 3/4 oz.
Engine complete with coil and condenser 1 lb. 14 oz.

Power:

Bore and stroke 1 1/4"x1 1/4"—B.H.P. 0.7 at 3800 R.P.M.
Traction with our propeller 8 lbs.
Note. This is according to dynamometer reaction tests.



Avion Gas Model Prop

The correct propeller is essential to good performance.

something of the activities of this new organization. He says:

"The Tri-State Model Association was formed last February by four men for the purpose of staging model airplane contests and to further the building of models in the Tri-State area. It is not a profit-making association in itself, but it has helped the manufacturers and dealers of model supplies. The pamphlet idea for obtaining prizes is a good one but a little more expensive than we anticipated. Our next one will probably have a small charge to the advertisers in addition to the prize contributed, as our expenses exceeded our income on the last contest. All of the pamphlets handed out at our contest were taken home as there were none picked up off the field after the contest, a condition highly pleasing to us.

"The Association has to depend on the dealers to donate the prizes and so far they have co-operated sufficiently to pay us for our efforts of boosting their business. Our expenses are met by charging an entry fee to the contests. A person upon entering a contest becomes a member automatically, and at present we have approximately one hundred members.

"Three contests have been staged this year, and all three states were represented by contestants. The contest rules and regulations conform with N.A.A. specifications and sanctions were obtained in order to allow the contestants the opportunity of trying for world record flights."

We hear from many localities that this association is doing excellent work and

gives promise of being one of the strongest in the country in a short time.

Lebanon, Pa.

The sixth annual model airplane contest of the Lebanon Model Airplane Club was held on Saturday, August 27th, under N.A.A. sanction. It was sponsored by the Exchange Club of Lebanon and held at Horst Field, Lebanon, Pa. It appears that the prizes were "a lot of boloney"; for each of the eighty-six entered contestants received, as a souvenir, one and a quarter pounds of Lebanon bologna. Unfortunately there were a few accidents. Lew Kiefer, a judge, was slightly hurt on the chin when struck by a rubber driven model and a first aid attendant suffered a slight injury when struck in the back by a gas model. Winners in the various events were:

Power Models: Robert Jacobson, Philadelphia, first with a time of 7 minutes, 39 seconds. Baltimore, Md. (no name given), second with 7 minutes, 36.4 seconds. Fuselage models: First: Robert Gable, Reading, Pa., with 5 minutes, 54.2 seconds; Second: Ted Just, Johnstown, Pa., with 4 minutes, 58.6 seconds. Stick Models: First: Salem Barrack, Harrisburg, Pa., 4 minutes, 47.8 seconds. Second: Fred Honeker, Reading, Pa., 4 minutes, 11.4 seconds. Glider Models: First: Stephen Kowalik, Wilmington, Del., 1 minute, 55.8 seconds. Second: Henry Struck, New York City, 1 minute, 46 seconds.

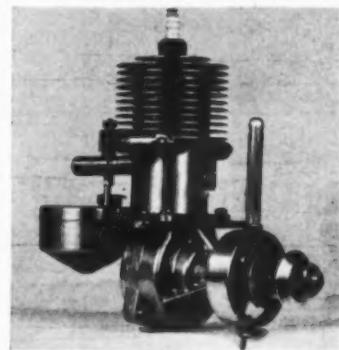
We are indebted to Harry E. Meyer of 612 Walnut Street, Lebanon, Pa., for this information.



COMPLETE BIKE GIVEN

Meed make—What a Bike! Or big cash commission. YOURS for **Simply Giving Away FREE** Pictures with our famous **WHITE CLOVERINE SALVE**, used for burns, chaps, etc., sold to friends at 25c a box (with picture FREE) and re-mitting per catalog. **FREE GIFTS!** 42nd year. Send for order of Salve, etc. Be First. Write to **WILSON CHEM. CO., Inc., Dept. 55-BY, Tyrone, Pa.**

You Need POWER . . .



now more than ever, to get your plane upstairs in minimum time. No other motor can give you the climb, none is more consistent, none more reliable.

Whether you are building a five foot racer or a ten foot radio controlled job "FORSTER" is the answer to your need for power.

The more experienced flyers are powering their ships and winning with "FORSTER" motors. No greater tribute could be paid their superiority. Ask the owners.

Assembled, tested, and run at the **\$17.75** factory.

Enclose stamp for literature

FORSTER BROTHERS
519-521 Lake St. Maywood, Ill.

THE NEW HUSKY HAS EVERYTHING— Instant Starting—Abundance of Power—Idles Steady at 250 R.P.M.— Full Speed Up to 8000 R.P.M.—BUILT to LAST

THE LIGHTEST COMPLETE READY TO RUN GAS MOTOR ON THE MARKET

The New "Auto Type Snap Spark Ignition" Starts the "HUSKY" Right Now—This new feature does away with the breaking of the old style upper spring used on the Husky Jr. Also you don't have to dismantle the timer to clean and adjust the points, which can be done in a few seconds. We guarantee the "Husky" to give you 100% satisfaction. The NEW "HUSKY" runs Equally as well Upright or Inverted and was Designed to Fly Models Weighing from 16 oz. up to 212 lbs. The "HUSKY" will run Steadily at any Speed from 250 R.P.M. up to 8000 R.P.M. using either a 11" or 12" Prop. The NEW "HUSKY" is BEAUTIFULLY FINISHED THROUGHOUT—It is BUILT to WITHSTAND any TEST it is put to—Each motor is THOROUGHLY TESTED, RUN IN and FULLY GUARANTEED to GIVE you Consistent Performance and LONG LIFE. 54" bore, 1 1/2" stroke. Wt. ready to run \$13.25. Including 5-0 pencils for Current.

We are going to see to it that every HUSKY owner will be completely satisfied and a hundred per cent booster. You can't go wrong. ORDER YOUR HUSKY TODAY! IMMEDIATE DELIVERY.

Husky motor mounts, wt. 2 1/2 oz., per pr., postpaid. 50¢
Husky Non Brittle prop. 11" or 12" each, postpaid. \$1.00
Postpaid. \$12.50

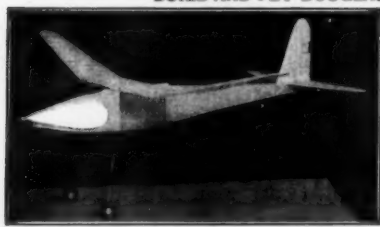
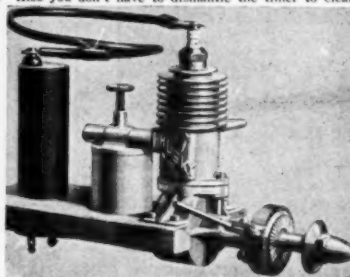
If your dealers do not sell HUSKIES order direct from

HUSKY MINIATURE MOTOR CO.

1400 North 45th Street, SEATTLE, WASH., U. S. A.

The Douglas Model Aircraft Co. Now Owns One-half Interest in the Husky Miniature Motor Co.
BUILD AND FLY DOUGLAS UNIQUE CONTEST WINNERS

Douglas-Designed "SPACE-CONQUEROR"



AERO GLIDE—Wingspan 41", length 30", wt. 3 oz. Kit contains all parts to assemble folding propeller—M&M model wheels—special brown contest rubber motor—glue, dope, tissue, wing ribs and other parts printed on "AAA" sheet balsa—all strips cut to size—full size detail 3-view drawing.

Douglas-Designed Aerobat with Automatic Folding Prop. Span 26", length 19". Kit complete \$2.25 Postpaid \$3.25.

Send Money Orders or CASH only. When sending cash fasten coin to letter with adhesive tape. If located in Washington add State Tax.

DOUGLAS MODEL AIRCRAFT CO.
1400 North 45th St., Dept. 12, SEATTLE, WASH., U.S.A.

SpeedWay GRINDER 595
Now **REAL Quality Tools**
Products of SpeedWay, leading manufacturers of electric tools for industry, these new drills are correctly designed, operate at most efficient speeds, and embody the feature, power and capacity of much heavier and more costly tools.
1000 RPM DRILL powered by genuine high torque SpeedWay Drill motor has die cast handle and rear case. \$7.95.
20,000 RPM HAND GRINDER, new for more efficient design. \$5.95.
SpeedWay No. 230 Kit—Drill, Grinder and 5 accessories in steel carrying case \$14.95. Also complete line of cutters, stones, etc., and stand to convert into lever fed Drill Press or Precision grinder. Ask your dealer or write direct for circular. Dealers write!
SPEEDWAY MFG. CO.
1859 S. 52nd Ave., Cicero, Illinois

FRONTIER
45 caliber
MODEL \$1.45
Colt single action army revolver FRONTIER model with machined cylinder, rod ejector and four and three quarter inch barrel..... \$1.45
Above with five and one-half inch barrel..... 1.55
Above with seven and one-half inch barrel..... 1.70
Half scale Thompson Sub Machine Gun model kit 1.00
Full scale Thompson Sub Machine Gun model kit 3.00
Full scale Colt cal. .45 automatic pistol kit..... 1.00
Full scale Colt cal. .25 automatic pistol kit..... .50
Savage calibre 32 auto. pistol with mach. barrel. .75
Luger 9 M/M auto. pistol w/4-in. mach. barrel 1.75
Same as above with six inch machined barrel..... 1.90
These beautiful kits are complete in every detail and made of the best basswood. All parts are cut to shape and require only a short time to finish.
They are to be made for display purposes and you will be more than proud to show them to everyone. Postpaid in U.S.
Send for FREE illustrated circular
GUN MODEL CO., Dept. E-32, 2908 N. Nordica Ave., Chicago, Ill.

A 27 mile wind made flying difficult and caused numerous crack-ups. There were over 5,000 spectators at the Airport to witness this meet and the refueling of the State Fair Endurance plane. The entries surpassed that of the 1937 State Fair Meet and were as follows:

Stick Models.....64 Cabin Models.....68
Gas Event.....69 Scale Contest.....16

Mr. Harry C. Copeland was Contest Director.

Pittsburgh

The fifth WPA Scale Model Contest will be held on November 12th. Mr. Harry G. Vogler Jr. is the director of the aircraft division of this organization and will sponsor the event, which will be open to builders of the entire tri-state area. There will be two divisions, junior for those builders under sixteen, and senior for those over sixteen. Closing date of entries is November 9th at 9 p.m. Mr. Vogler may be reached at Boys Club of Pittsburgh, 4412 Butler Street, Pittsburgh, Pa.

Lakeland

A state-wide contest will be held at Lakeland, Florida, on Thanksgiving Day, November 24th. The meet will be conducted by the Lakeland High Model Club and will be sponsored by the Chamber of Commerce. Events will include glider, rubber powered and gas powered models. For entry blanks and further information contact Walter Seegmiller, 921 East Osceola Street, Lakeland, Florida.

Boston

The Junior Aviation League of Boston, Mass., will hold indoor contests this fall on November 19th, December 3rd and 17th, at the South Armory, Irving Street, Back Bay, Boston. Flying will continue from 9:30 a.m. to 12:30 p.m. For further details write Mr. A. Lewis, Jordan Marsh Company, Boston, Mass.

Syracuse

The results of the New York State Fair Model Airplane Contest, held at Syracuse Airport, New York, on September 4 under N.A.A. sanction, are now available. Sponsor of this event was the Syracuse Model Airplane Club. The events, and respective winners, were:

Gas Model Event			
1. Roger Desbrosses	New York City	3m 10.8 secs.	Gold Trophy
2 Larry Low	New York City	2m 11.8 secs.	Gold Trophy
Stick Event (Senior)			
1. Robert Dillman	Syracuse, N.Y.	2m	Silver Trophy
2. Kale Harden	Binghamton, N.Y.	1m 51 secs.	Silver Trophy
Cabin Model (Senior)			
1. Clement Buell	Binghamton, N.Y.	2m 5.6 secs.	Gold Trophy
2. Raymond Darling	Utica, N.Y.	1m 55.2 secs.	Gold Trophy
Stick Event (Junior)			
1. Donald H. Pratt	Bainbridge, N.Y.	1m 17. secs.	Silver Trophy
2. Patsy Fiumano	Syracuse, N.Y.	1m 7. secs.	Medal
Cabin Model Event (Junior)			
1. Patsy Fiumano	Syracuse, N.Y.	1m 22. secs.	Gold Trophy
2. Edward Izzo	Syracuse, N.Y.	1m 40. secs.	Medal
Senior High-Point Winner: Kale Harden, Binghamton, N.Y., who received the Alex. Grant Trophy (1 year)			
Junior High-Point Winner: Patsy Fiumano, Syracuse, N.Y., who receives the Edwards Aero Club Trophy for 1 year			
Exhibition Scale Contest (Senior)			
1. Max Sokol	Hamtramck, Mich. (Stinson Reliant)	Silver Trophy, also Exchange Trophy for 1 year	
2. Chas. H. Hawley	Syracuse, N.Y. (Seversky P-35)	Medal	
Exhibition Scale Contest (Junior)			
1. William H. Lacey	Syracuse, N.Y. (Boeing P-26a)	Plaque	
2. Jack Daugard	Syracuse, N.Y. (Super-Ace)	Medal	

COMET presents the

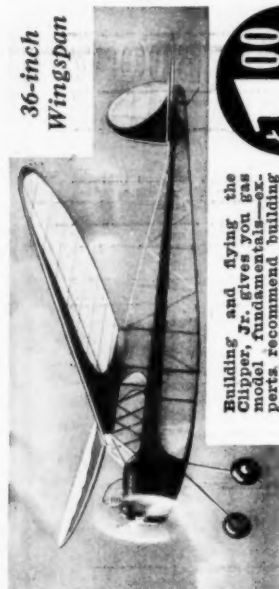
CLIPPER Junior

- Looks like a
- Sounds like a
- Flies like a

GAS MODEL

COMET MODEL AIRPLANE & SUPPLY COMPANY
2059 W. Cermack Road, Chicago, Dept. MN12, Eastern Branch: 688 Bway., New York, N. Y.

Here's something new, different, sensational! The rubber-powered Comet Clipper, Jr., scaled right down from the Comet Clipper! Engine, rear gadget, high climb, flat glide; 36" elliptical wing detaches in event of collision. Kit contains imitation gas motor, motor, rear device, wheels, cement, tissue, finished propeller, metal cylinder flanges, sharply printed Balsa, plenty of rubber.

36-inch
Wingspan

Building and flying the Clipper, Jr. gives you gas model fundamentals—expert recommendations—the Jr. before you tackle your first gas model. Your new hobby has any look at that price—only \$1.00 complete!

Postage 15c; none if ordered from dealer.



propeller being geared to one-half engine speed. The power output of the engine is the only factor to be concerned with in this case. The horsepower of the average common gas engine of the type used in model planes may be determined by the following formula:

$$H.P. = (0.0000833) \text{ Cu (R.P.M.)}$$

Thus we see that if a motor develops 1/5 horsepower at 10,000 R.P.M., the cubic inch displacement of the piston, (Cu) may be determined readily by solving the formula as follows:

$$0.2 = (0.0000833) \text{ Cu (1000)},$$

$$\text{or } \text{Cu} = \frac{0.2}{0.833} = 0.24 \text{ cubic inches.}$$

The value of (Cu) for the normal 1/5 hp. motor at 4000 R.P.M. is 0.6 cubic inches. If a motor of this cubic inch displacement develops its maximum power at 8000 R.P.M., the power at this speed will be 2/5 hp. = (0.4) hp. It may be seen from this that the cubic inch displacement of the piston (Cu) is not an indication of the horsepower developed by the motor.

Therefore the propeller should be designed to absorb the horsepower of the engine when it is turning at its normal running speed and the propeller is revolving at the speed at which the correct pitch for the plane's speed was determined. If the propeller is mounted directly on the motor shaft, which is normal practice, the engine and propeller speed will be the same. Then the engine horsepower and the propeller's pitch, diameter and blade width should be calculated at the same (R.P.M.). However if the engine and propeller run at different speeds the engine power should be calculated at its running speed and the propeller at its speed of rotation.

If the required propeller pitch, cubic inch piston displacement, engine speed and propeller speed is known, the other characteristics of the propeller (diameter and blade width) may be determined by means of a formula. This shows also the mathematical relationship existing between all the quantities involved. It may be applied whether or not the propeller and engine speeds are the same. It is as follows:

$$\text{Cu (V}_M) = (0.000000305)^2 (V_P)^3 \text{ P W}_B \text{ D}^3$$

In the formula: Cu = the piston displacement in cubic inches; V_M = the engine revolutions per minute when developing its maximum power; V_P = the propeller revolutions per minute when the engine is turning at V_M ; P = the propeller pitch required; W_B = the blade width necessary and D = the diameter of the propeller.

Now suppose we take a practical problem as an example. A plane is being designed which will have a flying speed of twenty miles per hour: The motor has a piston displacement of 0.6 cubic inches and its normal running speed (V_M) is 4000 R.P.M. The motor may develop more power at a higher speed, but it must be remembered that the efficiency of propellers at speeds over 6000 R.P.M. is very low. If a high engine speed and a low propeller speed is desired, gears may be used to obtain the proper speed ratio.

CLASSIFIED DIRECTORY

Advertise in this directory for quick profitable results! Rate 10¢ per word. Minimum 20 words. REMITTANCES MUST ACCOMPANY ALL ADS FOR THIS DIRECTORY. Advertisements for the January issue must be in by November 10.

MODEL AIRPLANES—KITS—SUPPLIES

127 120 116 films enlarged 4x6 35c complete. Send for price list and discounts on film and supplies. Star Photo, New Britain, Connecticut.

BROWN AERO RUBBER—Hodgman Rubber Company, 261 Fifth Avenue, New York City. Chicago office: 412 South Wells Street. Dealers and manufacturers only.

SPECIAL—Clear gas model dope and cement, pt. 40c, qt. 65c. Gunwood gas props, 12, 13, 14, 15" plain 30c, varnished 50c. Free catalog. Wilmer Model Aircraft Co., Wilson Ave., Frederick, Md.

DEALERS, Jobbers! Real profits on model supplies. Stamp brings new wholesale list. Modelers write for free retail list. Waterbury Model Builders Supply, 131 Cherry St., Waterbury, Conn.

ATTENTION gas and scale model builders. Send for amazing price list dealing with new line of metal parts and supplies. Penttinen Model Specialties, 284 St. Ann's Ave., Bronx, N.Y.

BARGAINS! Gas model kits, motors, supplies. Special prices. Send now for new free catalog. Hornet Model Airplane Company, Selma, California.

KWIK-STICK—Special gas model cement. Adds pleasure to model building. 1/2 pt. 35c, 1 pt. 65c. Largest variety gas kits and motors in Brooklyn. Motor mechanic on premises. Photo supplies. You-Zah's, 2192 Flatbush Ave., Brooklyn, N.Y.

READYBUILT 21" span, new design flying stick monoplane, 75c postpaid in U.S.A. L. M. Davis, 621 Gandy St., Denison, Texas.

ANNOUNCING the opening of a new model airplane supply store, handling complete line of model supplies. Quality balsa, spruce, props, fittings, etc. 2 Knowlton St., Bridgeport, Conn.

GAS Models. Super-Buccaneer (Brown) \$45.00; \$825 (Cyclone) \$45.00. Test hopes! See November "Gas Lines." F.O.B. Art Kronfeld, 430 Common St., Belmont, Mass.

DEALERS—Clubs—Get our discounts today. Modelers—Our complete gas model catalogue is free. GMS, 314M Second North, Syracuse, N.Y.

SENSATIONAL midsize racer kit complete in every detail, nothing extra to buy. A beautiful three quarter inch scale model sent postpaid, only 75c. Modern Model Makers, Inc., 5539 West Adams Blvd., Los Angeles, Calif.

TIMER—Amazing new dependable timer, Adjustable 10 to 60c. Weight 1 oz. 75c. M. Marian, 1918 W. 3rd St., Hastings, Nebr.

CANADIAN Gas Motors, 1/2 h.p., 6% oz. Original features. Send addressed envelope for information. Drimlie, 193 Gainsborough Road, Toronto, Canada.

FREE price list covers gas and rubber supplies and kits. Northwest builders—get orders in two days. Capital City Model Shop, 71 E. Arch at Jackson, St. Paul, Minn.

SPECIAL Experimenters Prices—Forster Motor \$17.75, Berkeley Cavalier \$15.00, both for \$30.00. Raytheon RK62 Tube designed for Radio Control \$3.50. Sigma Relays \$4.95. All recommended for Radio Control by leading authorities. Send for free Booklet on Radio Control and Model Supplies. Radio Aircraft Company, 189 Ulrica Avenue, Brooklyn, N.Y.

FREE Christmas Offer: Print name and address on postcard and mail to H & P Model Airplane Co., 459 Bristol Street, Brooklyn, N.Y.

DEALERS—We carry the following national advertised lines: Burd, Comet, Continental, Cleveland, Ideal, J. L. Wright, Airway, International, Construct-A-Plane, over 500 different kits. Also gas motors, supplies, etc. Send for new list. New England Model Airplane Distributing Co., 66 N. Washington St., Boston, Mass.

FREE—2 sheets tissue with price list. Includes supplies, kits and engines. Northwest builders—our central location saves you two or more days on delivery. Capital City Model Shop, 71 E. Arch at Jackson, St. Paul, Minn.

DEALERS, Clubs, Schools: Send for low, complete wholesale list, including gas model supplies. Save money. Model Airplane Utility, 5307 New Utrecht Ave., Brooklyn, N.Y.

(The author strongly advises that such a system be used if high efficiency and best results are urgent.) In this case the propeller will turn at engine speed, it being mounted directly on the shaft. Therefore V_P is 4000 R.P.M.

Under these conditions the correct pitch may be obtained from the chart or it may be calculated by the following formula:

$$P = 1600 \left(\frac{V_A}{V_P} \right)$$

In the formula: P = the propeller pitch in inches; V_A = the speed of the airplane in miles per hour, and V_P = the velocity of the propeller in revolutions per minute. It is solved as follows:

$$P = 1600 \left(\frac{20}{4000} \right) = 8 \text{ inches.}$$

Thus the pitch should be eight inches, under these conditions.

At this juncture the most efficient blade width should be decided upon. A width equal to one-tenth the diameter ($D/10$) will be very efficient, so this value is selected. When the known numerical values are inserted in the formula; it may be solved for (D), the remaining unknown value, as follows:

$$(0.6) (4000) = (0.000000305)^2 (64,000,000) \text{ times } (8) D/10 (D)^2,$$

simplifying:—

$$0.6 = (0.000000305)^2 (12,800,000) D^4,$$

or

$$(0.6) = (0.0000000000093) (12,800,000) D^4,$$

$$\text{or } D^4 = \frac{0.6}{(0.000000093) (128)} = \frac{0.6}{(0.0000119)}$$

$$\text{Then: } D = \sqrt[4]{50,400} = \sqrt[4]{224.3},$$

or, $D = 15$ inches. (Diameter of the propeller).

The blade width now may be found:

$$W_b = D/10 = 15/10 = 1.5 \text{ inches (Blade width).}$$

The propeller for the plane specified, then, should have a pitch of eight inches, a diameter of fifteen inches and a blade width of 1.5 inches.

The reader may say to himself: "This is very fine, but—how do I make a propeller to these specifications?" How this may be accomplished will be shown in the next article, to appear in the January, 1939, issue of MODEL AIRPLANE NEWS.

Correction

In the last issue of this magazine, November 1938, a typographical error was made in the table appearing on page 17, in the column "Camber Factor." The decimal point was to the right of the first zero. This is misplaced—it should be to the left of the first zero. In other words; the first camber factor for the Grant X should read (.0885).

Gas Lines

(Continued from page 62)

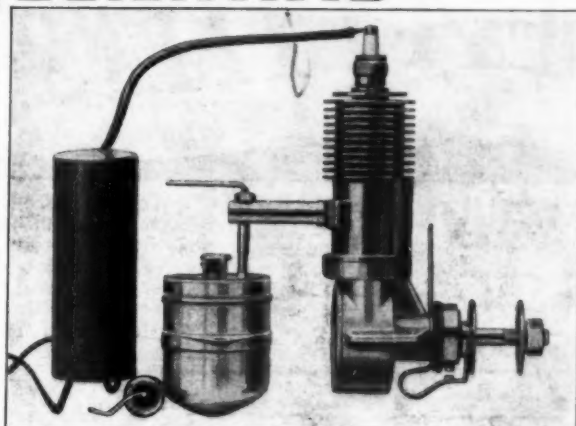
W. E. Marienschek. The contest was officially sanctioned by the National Aeronautic Association.

"Although the weather was not very favorable, there were ninety-five entries from all parts of the east, making the meet very successful. In addition to a beautiful fifteen-inch trophy which was donated by the members of the Queen City Club, there was \$75.00 worth of model supplies donated by manufacturers, and awarded as prizes.

N.A.A. Youth Memberships Nearing 5000 Mark

N.A.A. Junior and Gas Model Memberships have increased over 300% since January 1st! A report on Youth Division activity covering the first eight months of the year shows that Youth Membership stood at approximately 1500 on January 1st, and 4782 on September 1st. Of the September 1st total, 2507 were re-

SCIENTIFIC



THE New Improved 1939 Model "D" has everything, power, speed, stamina, and sound engineering advances. In every way it lines up with the famous Brown motors that have won first places and flight records everywhere. The same high quality metals are used, such as alloy steel cylinder with aluminum alloy piston and 2 special rings, forged aluminum connecting rod, simplified pin type control, and other high quality features. Order early from Scientific for immediate delivery. COMPLETE ENGINE READY TO RUN, INCLUDING FUEL TANK, COIL, CONDENSER, ETC., FOR ONLY \$10.00, POSTPAID.

Included at no additional cost is a motor manual containing all information on the operation and care of your engine. This manual is included with all Brown Jr. engines.

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In Australia: Swift Model Aircraft, 159 Adelaide St., Brisbane, Queensland.
In South Africa: Stratosphere Model Aircraft Supplies, P. O. Box 3248, Johannesburg.

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BROWN JR. ENGINE

AT \$10.
ONLY POSTPAID

Complete, Ready to Run
Immediate Delivery

SPECIFICATIONS
7 1/2" Bore, 1" stroke; 1,200-10,000 R.P.M. Height 4 3/4", 1/2" Horsepower.
Actual scale weights: Bare motor 3 1/2 ozs.
Complete with coil, tank, and condenser (as furnished) 11 1/2 ozs.
Ready to run with gas, two batteries, and propeller 20 1/2 ozs.
Two Standard 1 1/2 volt flashlight cells required for current.

OTHER BROWN JR. ENGINES



MODEL C
Offers the proven advantages of the Brown Jr. motor at a medium price. Complete, ready to run

MODEL B
Long famous for its power, smooth running, and high compression. Complete, ready to run

MODEL M MARINE
Built to high exacting standards for use in model boats. Complete, ready to run

\$17.00

Postpaid

\$21.50

Postpaid

\$15.00

Postpaid

ported as Gas Model Members under the new licensing system inaugurated this spring.

Minneapolis

Richard W. Billett of 2548 Nicollet Avenue, Minneapolis, Minn., sends us the following report of the Northwest Model Air Meet, held on September 25th at the Cedar Airport, Minneapolis. Winner of the gas model event was Robert Toft, 18, 3128 East 36th Street, Minneapolis. The report follows:

"The contest drew over 200 entries throughout the northwest, and the number of spectators was conservatively estimated at 15,000. All in all it was very successful from a standpoint of attendance.

"A rather brisk breeze, lasting all day, didn't permit much in the way of good time and the fatalities amongst the gas jobs, particularly, was terrific. In spite of these handicaps though, the winning times in each event were better than average. Many flights of interest to both contestants and spectators were made.

"From the experience gained at this, our first meet of any consequence, we feel assured that we can promise one of the biggest and finest meets in the country for next fall. This meet was put on in four weeks time.

Anyone who is interested in entering future contests in the vicinity of Minneapolis should contact Mr. R. W. Billett.

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BIG PAY GOOD FUTURE
If you are interested in training yourself for a highly paid position in the aviation industry—write, immediately, inclosing stamp.

Mechanics Universal Aviation Service Co., Wayne County Airport, Box 857, Dept. 1, Detroit, Mich.

QUIT STALLING

and get the best results from your engine by the use of a

SMITH IGNITION COIL

The quality of our coils remains long after the price is forgotten. For this reason we point with pride to just a few of the many contests that have been won with the use of our ignition equipment—

1st German Nationals
1st Russian Nationals
1st American Nationals

1st French Nationals
1st British Nationals
1st in local and State contests too numerous to mention.



LIGHTWEIGHT FIRECRACKER
Wt. 1 1/4 oz.
\$3.00

Big-Shot
Wt. 2 1/2 oz.
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Big-Shot
Wt. 5 oz.
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1814 West 8th St., Los Angeles, Calif.

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Wood can be had in Spruce, Bass or Balsa at the same price as those listed below.

Balsa	
5 ft. lengths	
1/8x1/8	4 for .10
1/8x1/4	2 for .14
1/8x1/2	2 for .15
3/16x3/16	8 for .25
3/16x1/2	2 for .19
1/4x1/4	6 for .25
1/4x1/2	4 for .25
1/2x1	3 for .25
3/8x3/8	3 for .25
3/8x1/2	3 for .27
1/2x1	1 for .18
1x1	1 for .25

SHEET BALSA	
36" Lengths	
1/16x2	.04
3/32x2	.05
1/8x2	.05
1/4x2	.09

BAMBOO PAPER	
24"x36", 1 sheet	.05

SPECIAL JAP SILK

A strong, light silk imported specially for gas models.

Grade A, 1 yd.	.40
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MODEL AERONAUTICS YEAR BOOK

This book contains more than 80 detail plans of both gas and rubber powered models.

Price	\$1.00 p.p.
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TOGGLE SWITCHES

An on-off switch for gas models which will not jam; very useful.

Each	.35
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SPARK PLUGS

Brown Jr. Plugs for engines. Recommended for balky motors especially.

Each	.66
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CHAMPION PLUGS

Each	.65
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CEMENT

4 oz.	.18
8 oz.	.35
1 lb.	.60

Dope, Paper Adhesive, Colored Dope same prices as cement.

SPRING STEEL WIRE

1/16 dia., 5 ft.	.12
3/32 dia., 5 ft.	.15
1/8 dia., 5 ft.	.25

DURAL ANGLES

1/8x1/8 per ft.	.15
3/16x3/16 per ft.	.22

BRASS ANGLES

1/8x1/8 ft.	.25
-------------	-----

DURAL TUBING

1/8 dia. ft.	.14
5/16 dia. ft.	.20

STREAMLINED ALUM. TUBING

1/8x1/8 ft.	.15
5/16x5/16 ft.	.16
3/8x3/8 ft.	.18

OHLSOHN AIR WHEELS

3 1/2" dia.	\$1.50
4 1/2" dia.	\$1.75

M & M AIR WHEELS

3 1/4" dia.	\$1.50
3 1/2" dia.	\$2.50
4 1/2" dia.	\$2.75

GAS MODEL WHEELS

Special Pneumatic wheels good for gas model from 3" to 4 1/2" dia.

Price per pair	\$1.35
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4" WOOD WHEELS

A strong wheel for rugged gas model use.

Per pair	.50
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KNIFE SWITCHES

Used in place of Toggle switch

2-pole-1 for.	.20
3-pole-1 for.	.30

SPARK COILS

Brown Jr. D.	\$3.50
Synco Super	\$1.95

GAS FUNNEL

Coil	\$1.00
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FLIGHT TIMER

with strainer	.30
0 sec. to 1 min.	\$2.00

CONDENSERS

Special gas model condensers.

1 1/2" long, 1 for.	.25
1 1/4" long, 1 for.	.25

REGULAR PLUGS and JACKS

Extra small-wt. 1/8 oz.

Per set of 4	.25
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WOOD SCREWS

1/2, 3/4, 1-6 for.	.05
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GLASS DROPPERS

Each	.5c
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ALLIGATOR CLIPS

Each	.10
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ALUMINUM RIVETS

(Lightweight)

3/32x3/16-1 doz.	.5c
1/16x1/4-1 doz.	.5c
1/8x1/4-1 doz.	.5c

TERMINALS (Spring Clips)

3 for	.5c
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From 10c to \$25, you will find on these pages a suitable and year-round-pleasure-bringing gift for every boy or man from 6 to 60. Don't forget that Model Airplane building and flying is the **FASTEST GROWING HOBBY AND SPORT** in the country today! Make your selection in plenty of time for Christmas.

HEATHE'S New MONARCH "King of the Skies"

Everything you desire in a high-powered gas model. Beautiful lines, easy construction, unexcelled performance. Modern twin rudders and airtail section and with simplified tapered wing. All wood, finished prop, wheels and dope, glue and tissue. Most complete kit.

5 ft. 8 in. Wingspan

\$4.75

P. P. in U. S. A.

HEATHE'S New WASP

3 ft. 6 in. Wingspan

\$3.75

P. P. in U. S. A.

A most complete and detailed—and at the same time—low priced Gas Model. Kit is absolutely complete, containing Balsa cut to correct size, nuts, bolts, rubber, bamboo, paper, full size detailed plans—giving all information necessary for building and flying this efficient, powerful, good-looking plane.

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We have reached an important milestone in our business history. From a hopeful beginning, actually in basement quarters, we have slowly but surely grown to where we now occupy a large show room, mezzanine offices, shipping loft and a separate factory. We have grown because of our business policy which is based on the points:—(1) COMPLETE STOCKS; (2) LOWEST PRICES; (3) 24 HOUR SHIPPING SERVICE! We now sell all over the United States—and have distributors in all principal countries.



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Complete, ready to run with coil and condenser. The new 3/16" Brown Jr. Model "D" \$1.50
Model "C" \$1.25
Model "B" \$1.00
Model "A" \$1.00
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TROJAN
Real power motor. Bore 3/16" Weight 4 1/2 oz.
\$1.50
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Continental's line contains a kit to satisfy every price range and need, superb in its accurate details, ease of building, durability and, above all, "fly-ability." The last word in model design!



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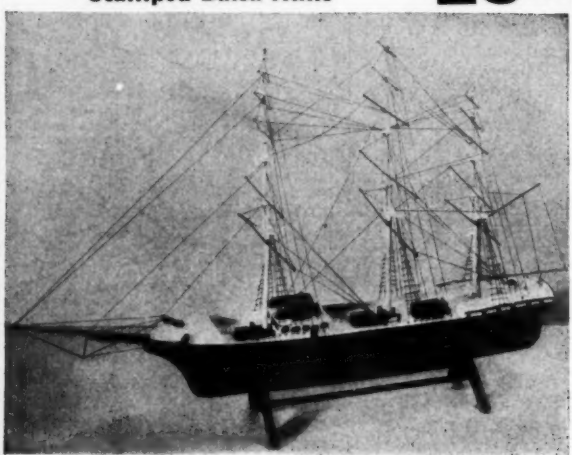
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4. Commander
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9. Major Endurance
10. Stinson SR-9B
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5. Farragut's Flagship "Hartford"
6. 1937 Cup Winner "Ranger"

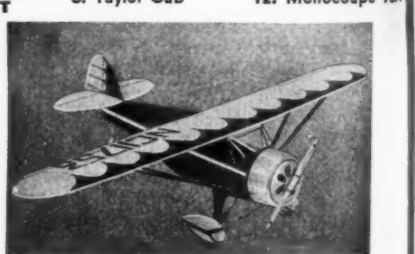
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SCOTLAND Rankine, Taylor & Co., 73 Robertson St., Glasgow, C.2, Scotland. NEW ZEALAND "Betta" Model Airplane & Supply Co., Brougham St., New Plymouth, N.Z.

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Naturally we are proud and happy! That's why we are throwing a Tenth Anniversary Party! We want our friends and customers to benefit with us. We are cutting loose with prices as never before—not on a few selected items—but, wherever possible, on EVERY SINGLE SUPPLY ITEM, KIT OR MOTOR. We are chopping prices with an axe! And on top of that—we give you FREE PREMIUM GIFTS with all your orders! Come on in and join the fun!

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Would you like to get a UNIVER CAMERA, EREC-TOR SET, TYPEWRITER, FLASHLIGHT, CHEMIS-TRY SET, WRIST WATCH or choice of many other Gifts—Free of charge! Only HEATHE gives you Premium Coupons with every order. These are desirable gifts that you select! Place an order and you will be able to get an EXTRA FREE GIFT!

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1/16 sq. x 14 35 for 5c
1/16 sq. x 11 1 doz. for 8c
18" PLANS
1x1 5c
1x1 1/2 10c
1x2 15c
2x2 25c
3x3 40c
3" sheets or 36" lengths
double above prices, add 10c for glue, charge for 50" lengths.
HIGH GLOSS
1 oz. 6c
4 oz. for 25c

ALUMINUM WHEELS
1" per doz. 08
1 1/2" per doz. 15
1 3/4" per doz. 20
2" per doz. 25
2 1/2" per doz. 30
3" per doz. 35
3 1/2" per doz. 40
4" per doz. 45
4 1/2" per doz. 50
5" per doz. 55
5 1/2" per doz. 60
6" per doz. 65
6 1/2" per doz. 70
7" per doz. 75
7 1/2" per doz. 80
8" per doz. 85
8 1/2" per doz. 90
9" per doz. 95
9 1/2" per doz. 100
10" per doz. 105
10 1/2" per doz. 110
11" per doz. 115
11 1/2" per doz. 120
12" per doz. 125
12 1/2" per doz. 130
13" per doz. 135
13 1/2" per doz. 140
14" per doz. 145
14 1/2" per doz. 150
15" per doz. 155
15 1/2" per doz. 160
16" per doz. 165
16 1/2" per doz. 170
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17 1/2" per doz. 180
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18 1/2" per doz. 190
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19 1/2" per doz. 200
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363" per doz. 3635
363 1/2" per doz. 3640
364" per doz. 3645
364 1/2" per doz. 3650
365" per doz. 3655
365 1/2" per doz. 3660
366" per doz. 3665
366 1/2" per doz. 3670
367" per doz. 3675
367 1/2" per doz. 3680
368" per doz. 3685
368 1/2" per doz. 3690
369" per doz. 3695
369 1/2" per doz. 3700
370" per doz. 3705
370 1/2" per doz. 3710
371" per doz. 3715
371 1/2" per doz. 3720
372" per doz. 3725
372 1/2" per doz. 3730
373" per doz. 3735
373 1/2" per doz. 3740
374" per doz. 3745
374 1/2" per doz. 3750
375" per doz. 3755
375 1/2" per doz. 3760
376" per doz. 3765
376 1/2" per doz. 3770
377" per doz. 3775
377 1/2" per doz. 3780
378" per



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Ma Koufies, first place at Chicago Meet, July 1938.

Robert Mazel, trophy for flight over 4 1/2 feet at Western States Contest, Reno, Aug. 7th, 1938.

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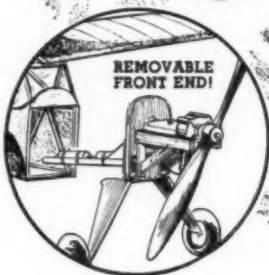
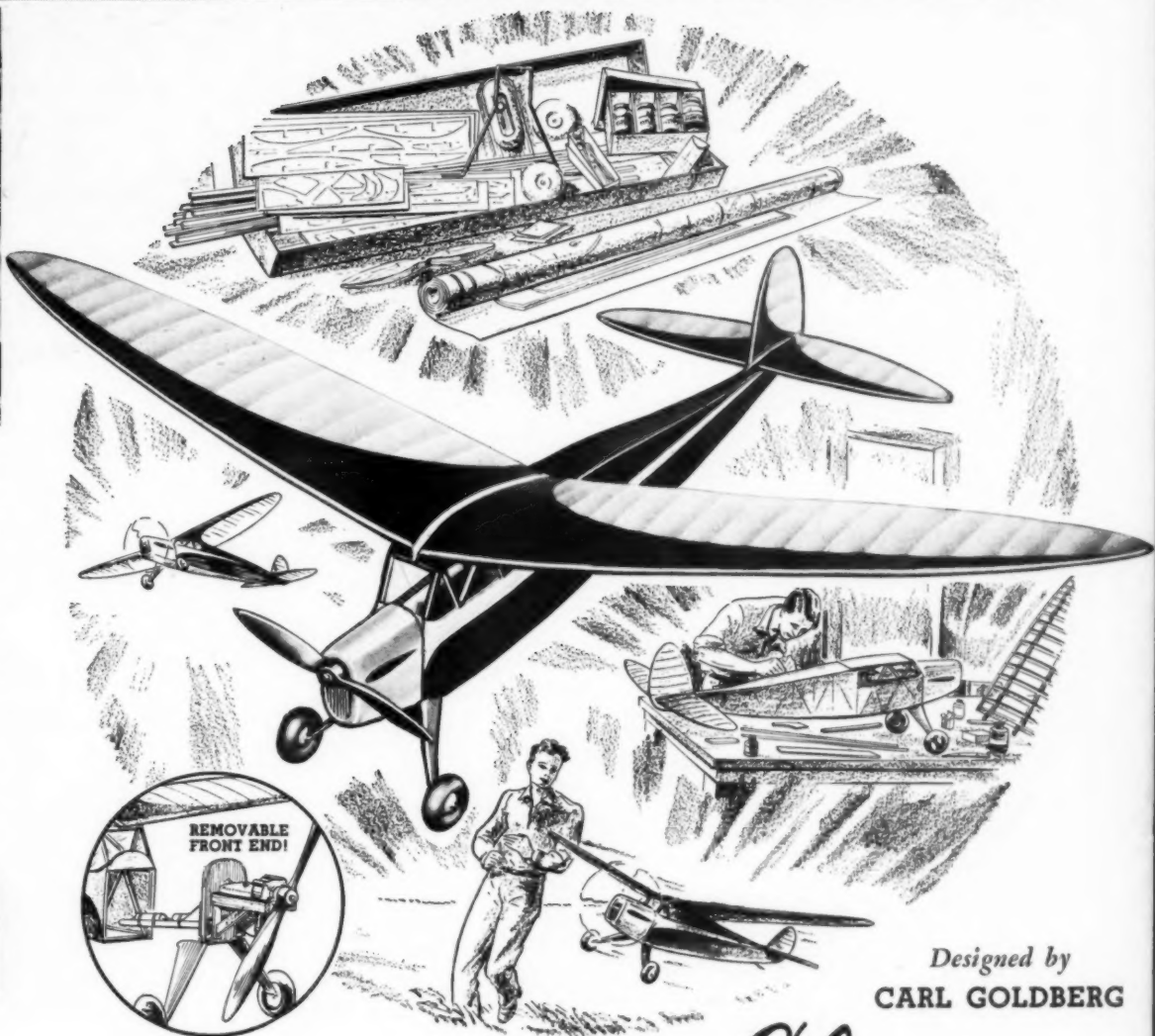
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